Program Syllabus Booklet

Bachelor of Computer Applications

(BCA- 300)
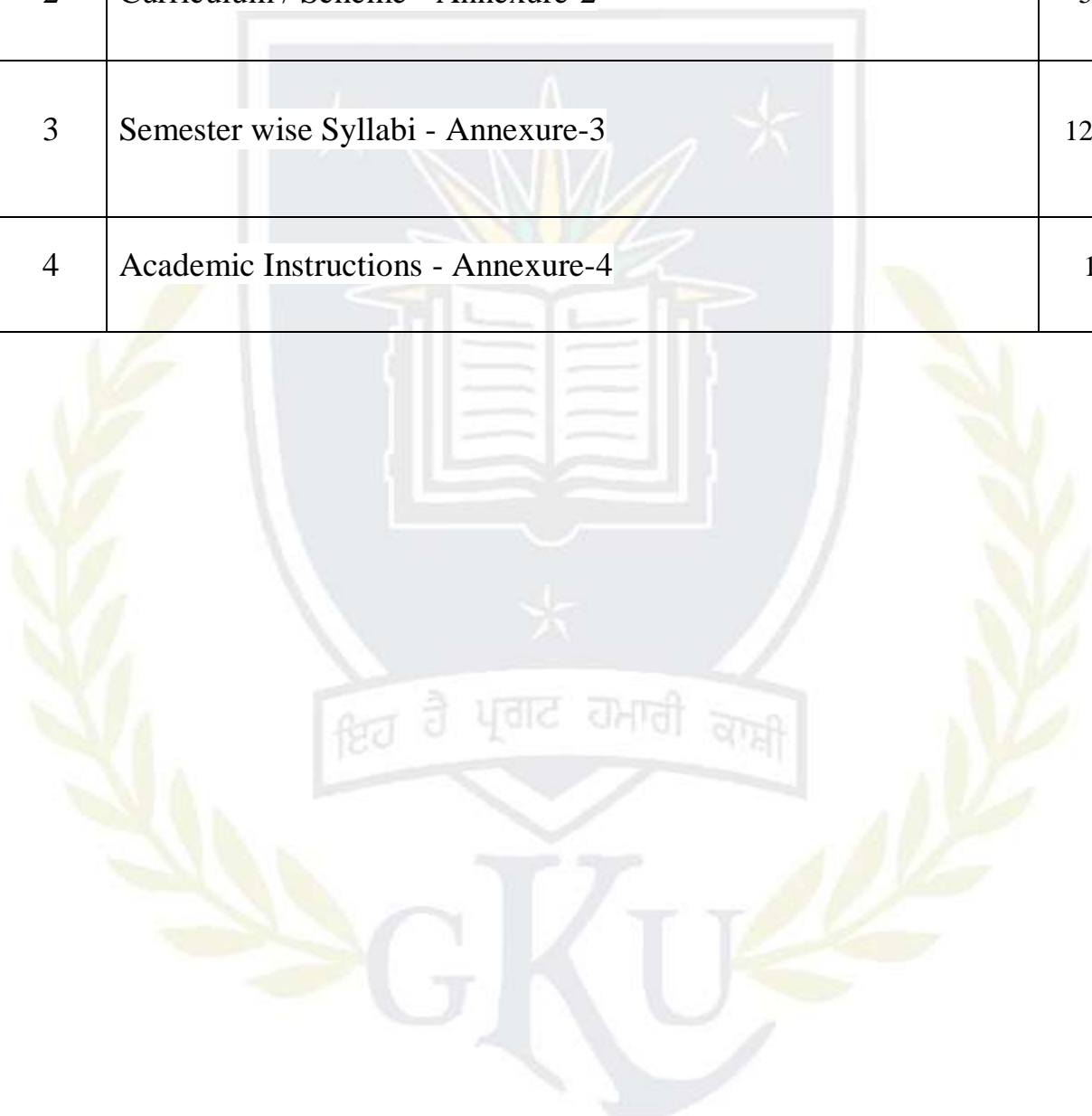

Session: 2020-21

University College of Computer Applications,

Guru Kashi University, Talwandi Sabo

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Program: Bachelor of Computer Applications (BCA)

Program Code: 300

Program Outcomes (PO): The Program Outcomes (POs) for the program Bachelor of Computer Applications are as follows:

PO	Statement
PO1	**Computer knowledge:** To apply the knowledge of mathematics, Computer fundamentals, and a web based specialization to the solution of complex programming problems.
PO2	**Problem analysis:** To identify, formulate, design, and analyze complex problems reaching substantiated conclusions using first principles of database, mathematics, data structure, and software engineering and development.
PO3	**Design/development of solutions:** To design solutions for contemporary problems and design system components or processes that meet the specified needs with appropriate consideration to investigate, understand and propose integrated solutions using emerging technologies.
PO4	**Conduct investigations of complex problems**: To use IT-based knowledge and problem solving methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage:** To create, select, and apply appropriate techniques, resources, and modern applications and IT tools including prediction and modeling to complex web based activities with an understanding of the limitations.
PO6	**The Programmer and society:** To apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional programmer practice.
PO7	**Environment and sustainability:** To understand the impact of the professional IT solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics:** To apply ethical principles and commit to professional ethics and responsibilities and norms of the IT practice.

PO9	**Individual and team work:** To function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication:** To communicate effectively on complex IT activities with the community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance:** To demonstrate knowledge and understanding of the IT and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning:** To recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcome (PSO): The Program Specific Outcomes (PSOs) for the program Bachelor of Computer Applications are as follows:

PSO	Statement
PSO1	To became a software engineer to fulfill the IT industry requirements.
PSO2	To attain technical knowledge in varied areas of Computer Applications and learn about programming skills for thriving career and higher studies.
PSO3	To implement computer programs in the allied areas like Algorithms, System Software techniques, Multimedia, Web Designing Code and Data Analytics for efficient design of computer-based systems of varying complexity.

				(Hours Per Week)						

Sr.	Subject Code	Subject Name	Type of Subject T/P	L	T	P	No. of Credits	Internal Marks	External Marks	Total Marks
1	A300101	Fundamentals of Computer and Information Technology	T	3	1	0	4	50	50	100
2	A300102	Programming Using C	T	3	1	0	4	50	50	100
3	A300103	Human Values and Ethics	T	3	1	0	4	50	50	100
4	A300104	Communication Skills-I	T	3	1	0	4	50	50	100
5	A300105	S/W Lab-I(Fundamentals of Computers and Information Technology)	P	0	0	6	3	60	40	100
6	A300106	S/W Lab-II(C programming)	P	0	0	4	2	60	40	100
7	A300107	Installation, Assembling and Networking of Computers (Practical)	P	0	0	4	2	60	40	100
Total No. of Credits			23							

Semester: 1st

Sr.	Subject Code	Subject Name	Type of Subject T/P	(Hours Per Week)			No. of Credits	Internal Marks	External Marks	Total Marks
				L	T	P				
1	A300201	Fundamentals of Web Technology	T	3	1	0	4	50	50	100
2	A300202	Data Structures	T	3	1	0	4	50	50	100
3	A300203	Programming Using C++	T	3	1	0	4	50	50	100
4	A300204	Communication Skills-II	T	3	1	0	4	50	50	100
5	A300205	S/W Lab-III (Programming Using C++)	P	0	0	6	3	60	40	100
6	A300206	S/W Lab-IV(Data Structures)	P	0	0	4	2	60	40	100
7	A300207	S/W Lab – V (Fundamentals of Web Technology)	P	0	0	4	2	60	40	100
Total No. of Credits			23							

Semester: 2nd

				(Hours Per Week)						
Semester: 3rd										
Sr.	**Subject Code**	**Subject Name**	**Type of Subject T/P**	**L**	**T**	**P**	**No. of Credits**	**Internal Marks**	**External Marks**	**Total Marks**
1	A300301	Digital Electronics	T	4	0	0	4	50	50	100
2	A300302	Discrete Mathematics	T	4	0	0	4	50	50	100
3	A300303	Operating Systems	T	4	0	0	4	50	50	100
4	A300304	System Analysis & Design	T	4	0	0	4	50	50	100
5	**Choice Based Course-I**		T	3	0	0	3	50	50	100
6	A300305	H/W Lab-VI (DE)	P	0	0	8	4	60	40	100
7	A300306	S/W Lab-VII(OS)	P	0	0	8	4	60	40	100
8	A300307	Industrial Training (4 weeks)	P	NA	NA	NA	2	60	40	100
Total No. of Credits				29						

Choice Based Course-I (Select one of the following subjects)

S.No	Subject Code	Subject Name
1	CB100325	Basics of Travel Tourism
2	CB100328	Introduction to Facilities Planning
3	CB100333	Marketing Management

Sr.	Subject Code	Subject Name	Type of Subject T/P	L	T	P	No. of Credits	Internal Marks	External Marks	Total Marks
1	A300401	Computer System Architecture	T	4	1	0	5	50	50	100
2	A300402	Database Management Systems	T	4	1	0	5	50	50	100
3	300407	E-Commerce and Governance	T	4	0	0	4	50	50	100
4	A100302	Environment Studies	T	3	0	0	3	50	50	100
5	A300404	Mathematics	T	4	1	0	5	50	50	100
6	A300405	S/W Lab-VIII(Database Management Systems)	P	0	0	6	3	60	40	100
7	300408	S/W Lab-IX(Workshop on PHP Programming)	P	0	0	6	3	60	40	100
Total No. of Credits			28							

The table is titled **Semester: 4th**.

				Semester: 5th						
Sr.	Subject Code	Subject Name	Type of Subject T/P	(Hours Per Week)			No. of Credits	Internal Marks	External Marks	Total Marks
				L	T	P				
1	A300501	Introduction to Java	T	4	1	0	5	50	50	100
2	A300502	Computer Networks	T	4	1	0	5	50	50	100
3	A300503	Software Engineering	T	4	1	0	5	50	50	100
4	A300601	Computer Graphics	T	4	1	0	5	50	50	100
5	A300505	S/W Lab-X (Java)	P	0	0	8	4	60	40	100
6	A300605	S/W Lab-XIII (Computer Graphics)	P	0	0	8	4	60	40	100
7	A300506	Industrial Training (6 weeks)	P	NA	NA	NA	2	60	40	100
Total No. of Credits				30						

Semester: 6th										
Sr.	Subject Code	Subject Name	Type of Subject T/P	(Hours Per Week)			No. of Credits	Internal Marks	External Marks	Total Marks
				L	T	P				
1	A300602	Multimedia Systems	T	4	1	0	5	50	50	100
2	A300603	System Software	T	4	1	0	5	50	50	100
3		**Elective -I**	T	4	0	0	4	50	50	100
4		**Elective -II**	T	4	1	0	5	50	50	100
5	A300604	S/W Lab-XII(Major Project)	P	0	0	4	2	60	40	100
6	A300606	S/W Lab XIV (Multimedia Systems)	P	0	0	4	2	60	40	100
7		**Elective –II Lab**	P	0	0	8	4	60	40	100
Total No. of Credits							27			

Elective-I (Select one of the following subjects)		
S. No	Subject Code	Subject Name
1	300608	Artificial Intelligence
2	300609	Soft Computing
3	300610	Neural Networks
Elective –II(selecting one of the following subjects)		
1	300507	Android Programming
2	300611	Programming using Python
Elective –II Lab(selecting one of the following subjects with its lab (Elective lab –II)		
1	300508	S/W Lab XI (Android Programming)
2	300612	S/W Lab –XVI (Programming using Python)

Course Name: Fundamentals of Computer and Information Technology

Course Code: A300101

Semester: 1st

L T P

Credits: 04   **3 1 0**

Course Outcomes: On successful completion of this course, the students will be able to:

CO	Statement
CO1	Classify binary, hexadecimal and octal number system and their arithmetic operations.
CO2	Analyze the concept of computer devices and recognition of the basic terms used in computer programming.
CO3	Identify and learn the details of the components of a personal computer system.
CO4	Demonstrate the functions of computer programming languages.
CO5	Utilize the Internet Web resources.

Course Contents

UNIT-I

Computer Fundamentals: Block diagram of a computer, characteristics of computers and generations of computers.

Number System: Bit, byte, binary, decimal, hexadecimal, and octal systems, conversion from one system to the other, representation of characters, integers and fractions.

Binary Arithmetic: Addition, subtraction and multiplication.

Computer Codes: weighted and non-weighted code, BCD, EBCDIC, ASCII, Unicode.

UNIT-II

Input Devices: Keyboard, Mouse, Joy tick, Track Ball, Touch Screen, Light Pen, Digitizer, Scanners, Speech Recognition Devices, Optical Recognition devices – OMR, OBR, OCR

Output Devices: Monitors, Printer and its Types.

Memories: Units of Memory, Main Memories - RAM, ROM and Secondary Storage Devices - Hard Disk, Compact Disk, DVD.

Introduction to Computer Terms like Hardware, Software

UNIT - III

Computer languages: Machine language, assembly language, higher level language, 4GL. Introduction to Compiler, Interpreter, Assembler, Assembling, System Software, Application Software.

MS Word: Introduction, Creating & Editing Word Document. Saving Document, Working

with Text: Selecting, Formatting, Aligning, Finding Replacing Text, Bullets & Numbering, Header & Footer, Working with Tables, Properties Using spell checker, Grammar, AutoCorrect Feature, Graphics: Inserting Pictures, Clipart, Drawing Objects, Setting page size and margins; Printing documents, Mail-Merge.

UNIT – IV

MS-Excel: Environment, Creating, Opening & Saving Workbook, Range of Cells, Formatting Cells, Functions: Mathematical, Logical, Date Time, Auto Sum, Formulas. Graphs: Charts. Types & Chart Tool Bar, Printing: Page Layout, Header and Footer Tab.

MS PowerPoint: Environment, Creating and Editing presentation, Auto content wizard using built-in templates, Types of Views: Normal, Outline, Slide, Slide Sorter, Slide Show, Creating, customized templates; formatting presentations, AutoShapes, adding multimedia contents, printing slides

Internet: Basic Internet terms: Web Page, Website, Home page, Browser, URL, Hypertext, Web Server, Applications: WWW, e-mail, Instant Messaging, Videoconferencing.

Reference Book:

1. Sinha P.K. and Sinha P. (2002). *Foundations of Computing*, First Edition, BPB.
2. Sanders D.H. (1988). *Computers Today*, Fourth Edition, Mc Graw Hill.
3. Rajaraman V. (1996). *Fundamentals of Computers*, Second Edition, Prentice Hall of India, New Delhi.
4. Jain Satish (1999). *Information Technology*, Paperback Edition, BPB.
5. Srivastva Chetan. *Fundamentals of Information Technology*, Third Edition, Kalayani Publishers.
6. Long Larry and Long Nancy. *Computers*, Twelfth Edition, Prentice Hall.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	2	2	2	2	1	-	-	1	2	2	2	1	2	1
CO2	3	2	2	2	3	1	-	1	2	1	2	3	2	2	3
CO3	3	2	3	3	2	2	-	-	2	2	1	2	2	2	3
CO4	3	2	2	2	2	3	-	-	3	3	3	3	3	1	2
CO5	3	2	2	3	3	2	1	1	2	3	2	2	3	3	3
Average	**2.8**	**2**	**1.8**	**2.4**	**2.4**	**1.8**	**1**	**1**	**2**	**2.2**	**2**	**2.4**	**2.2**	**2**	**2.4**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

PUNJAB - INDIA

Course Name: Programming Using C

Course Code: A300102

Semester: 1st

L T P

Credits: 04   **3 1 0**

Course Outcomes: On successful completion of this course, the students will able to:

CO	Statement
CO1	Learn about the working of a digital computer.
CO2	Identify the computer components like primary, secondary devices.
CO3	Acquire knowledge about the concepts of Programming Languages
CO4	Implement the control statements in practical manner.
CO5	Write a C program for a given algorithm.

Course Contents

UNIT - I

Introduction: ANSI C standard, Overview of Compiler and Interpreters, Structure of C Program, Programming rules, Execution

Basic structure of C program: Character set, Identifiers and keywords, constants, variable, Data types, input and output, type conversion,

Operators and expressions: Arithmetic, Unary, Logical and Relational operators, assignment operators, Conditional operators, type conversion. Library functions.

UNIT - II

Input/ Output in C: Formatting input & output functions.

Decision making statements – if, else if

Control statements: branching, looping using For, While and Do-While statements, nested control structures, switch, break and continue statements.

UNIT - III

Arrays: Definition, declaration, assignment, one dimensional and two dimensional arrays.

Strings: input/output of strings, string handling functions, table of strings.

Pointers: pointer data type, pointer declaration, initialization, accessing values using pointers.

Functions: prototype, definition and call, formal and actual arguments, methods of parameter passing to functions, recursion versus iteration.

UNIT – IV

Structures and unions: using structures and unions, comparison of structure with arrays and union.

Files: opening and closing files, Basic I/O operation on files.

Storage Classes: automatic, external, static and register variables.

Text Book:

1. Kanetkar P. Yashvant. *Let us C*, Seventh Edition, BPB Publications, New Delhi.
2. Balagurusamy E. *Programming in C*, Tata Mc Graw Hill.
3. Byron G.S. *Programming in C*, Second Edition, Mc Graw Hills.
4. Kernighan & Richie. *The C Programming Language*, Second Edition, PHI.
5. Salaria R.S. *Problem Solving and Programming in C*, Second Edition.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	1	2	2	3	-	0	2	2	3	2	1	2	1
CO2	2	2	2	2	3	1	-	-	3	2	3	3	2	2	3
CO3	3	2	3	3	3	2	1	-	2	2	2	2	2	2	3
CO4	3	2	2	2	2	3	-	1	3	2	3	3	3	2	2
CO5	3	2	2	3	3	2	-	2	1	2	2	3	3	3
Average	2.6	2.2	2.0	2.4	2.6	2.2	1	1	2.4	1.8	2.6	2.4	2.2	2.4	2.4

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: Human Value and Ethics

Course Code: A300103

Semester: 1st

L T P

Credits: 04   **3 1 0**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Understand the core values of ethical behavior of an engineer.
CO2	Learn about awareness on professional ethics and human values.
CO3	Attain the work ethics into the young minds.
CO4	Get Knowledge of respect and confidence among their profession.
CO5	Create ethical vision and achieve harmony in life.

Course Contents

UNIT - I

Human Values: Morals, Values and Ethics - Integrity - Work Ethic - Service Learning - Civic Virtue - Respect for Others - Living Peacefully - caring - Sharing - Honesty - Courage - Valuing Time - Co-operation - Commitment - Empathy - Self-Confidence - Character – Spirituality.

UNIT - II

Engineering Ethics: Senses of 'Engineering Ethics' - variety of moral issued - types of inquiry- moral dilemmas - moral autonomy - Kohlberg's theory - Gilligan's theory - consensus and controversy - Models of Professional Roles - theories about right action - Self-interest - customs and religion - uses of ethical theories.

UNIT – III

Engineering as Social Experimentation: Engineering as experimentation - engineers as responsible experimenters - codes of ethics - a balanced outlook on law - the challenger case study.

UNIT – IV

Safety, Responsibilities and Rights: Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the Three Mile Island and Chernobyl case studies. Collegiality and loyalty - respect for authority - collective bargaining - confidentiality - conflicts of interest - occupational crime - professional rights - employee rights - Intellectual Property Rights (IPR) - discrimination.

Text Books:

1. Mike Martin and Roland Schinzinger (1996). *Ethics in Engineering,* Mc Graw-Hill, NewYork.

2. Govindarajan M, Natarajan S, Kumar V.S. Senthil (2004). *Engineering Ethics,* Prentice Hall of India, New Delhi.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	2	1	1	2	2	3	3	3	3	3	2
CO2	3	2	1	2	3	3	-	2	3	2	1	3	1	3	2
CO3	1	2	1	1	1	1	-	2	2	2	2	3	2	1	2
CO4	3	1	3	1	2	1	1	3	3	2	1	2	2	2	2
CO5	1	1	1	1	1	1	-	2	2	3	1	2	2	2	3
Average	**2.2**	**1.4**	**1.4**	**1.2**	**1.8**	**1.4**	**1**	**2.2**	**2.4**	**2.4**	**1.6**	**2.6**	**2.0**	**2.2**	**2.2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: Communication Skills - I

Course Code: A300104

Semester: 1st

L T P

Credits: 04   **3 1 0**

Course Outcomes: On successful completion of this course, the students will able to:-

CO	Statements
CO1	Take a course overview of prerequisites to Business Communication and awareness of appropriate communication strategies.
CO2	Formulate an outline for effective Organizational Communication.
CO3	Summarize the information, ideas, concepts and opinions from a variety of sources.
CO4	Attain the competence in oral, written, and visual communication.
CO5	Learn the correct practices about the strategies of Effective Business writing.

Course Contents

UNIT - I

English Language: Sentence, Parts of speech, Tenses, Active passive voice, Direct/Indirect speech, Creative writing& vocabulary, Comprehension passage, Reading of Biographies of at least 10 IT business personalities.

UNIT - II

Business communication: Types, Medias, Objectives, Modals, Process, Importance Understanding Barriers to communication & ways to handle and improve barriers.

Listening skills: Its importance as individual and as a leader or as a worker, Types of listening and Traits of a good listener, Note taking, barriers to listening & remedies to improve listening

UNIT – III

Non verbal Communication- understanding what is called non verbal communication, its importance as an individual, as a student, as a worker and as a leader, its types.

Presentation skills-Its Purpose in business world, How to find material for presentation, How to sequence the speech with proper introduction and conclusion, How to Prepare PPT& Complete set of required body language while delivering presentation.

UNIT – IV

Reading Skills- to enhance independent reading, Comprehension Passages, News / Magazine articles on stereotype topics, Poems – Abu Ben Adhem, The Tiger

Writing skills- Importance of reading and writing, improving writing skills through Basic cohesive paragraph writing, resume writing, Job application writing/acceptance letter

Text Book:

1.   Rodriguez M.V. *Effective Business Communication*

2.   Allen W. Standard. *Living English Structure*, Orient Longman

3.   Raman Meenakshi, Singh Parkash. *Business Communication*,   Paperback Edition, Oxford University Press.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	2	1	1	1	1	-	-	2	3	3	3	3	3	2
CO2	2	2	2	2	3	3	-	1	3	3	3	3	2	3	2
CO3	2	2	2	1	2	2	-	-	2	3	3	1	2	2	2
CO4	2	1	2	3	2	1	1	-	3	3	3	2	2	2	2
CO5	3	1	3	2	2	2	-	-	2	3	3	1	1	2	3
Average	**2.2**	**1.6**	**2.0**	**1.8**	**2.0**	**1.8**	**1**	**1**	**2.4**	**3**	**3**	**2.0**	**2.0**	**2.4**	**2.2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: S/W Lab–I (Fundamentals of Computer and Information Technology)

Course Code: A300105

Semester: 1st

L T P

Credits: 03   **0 0 6**

Course Outcomes: On successful completion of this course, the students will able to:-

CO	Statement
CO1	Compose, format and edit a word document.
CO2	Edit and forward email messages (with or without attachments).
CO3	Navigate and work on research field through the internet.
CO4	Utilize the MS PowerPoint with custom animation and slide orientation.
CO5	Perform coding in different programs with practical knowledge.

Course Contents

UNIT - I

MS Windows: Familiarizing with windows operating system; using built-in accessories; managing files and folders using windows explorer; working with control panel; installing hardware and software, Installation of MS Office.

UNIT - II

MS Word: Salient features of MS WORD, Starting and quitting of MS WORD, File, Edit, View, Insert, Format, Tools, Tables, Window, Help options and all of their features, Options and sub options etc. Transfer of files between MS WORD and other word processors and software packages.

UNIT – III

MS Excel: Spread Sheet. Getting started with Excel worksheet, Entering data into work sheet, Editing cell addressing, Ranges and range names, Commands, Menus, Copying and moving cell contents, Inserting and deleting rows and columns, Column width control, Cell protection, Printing reports, Creating and displaying graphs, Statistical functions.

UNIT – IV

MS Power Point: Salient features of POWER POINT, File, Edit, View, Insert, Format, Tools, and Slide Show.

Internet: Navigating with Internet Explorer; surfing the net, using search engines; using email.

Text Book:

1. Sinha P.K. (2002). *Foundations of Computing,* First Edition, BPB.

2. Sanders D.H. (1988). *Computers Today*, Fourth Edition, McGraw Hill.

3. Rajaraman V. (1996). *Fundamentals of Computers*, Second Edition, Prentice Hall of India, New Delhi.

4. Jain Satish (1999). *Information Technology,* Paperback Edition, BPB.

5. Srivastva Chetan. *Fundamentals of Information Technology,* Third Edition, Kalayani Publishers.

6. Long Larry & Long Nancy. *Computers,* Twelfth Edition, Prentice Hall.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	1	3	2	3	-	-	2	2	3	3	3	1	3
CO2	1	3	2	3	3	1	-	-	3	2	2	3	2	2	1
CO3	3	1	3	2	3	2	-	1	2	2	2	2	2	2	3
CO4	3	2	2	2	2	3	1	-	3	2	2	3	1	2
CO5	3	2	2	2	3	3	-	-	2	2	2	2	3	3	3
Average	**2.4**	**2.2**	**2.0**	**2.4**	**2.6**	**2.4**	**1**	**1**	**2.4**	**2.0**	**2.2**	**2.4**	**2.6**	**1.8**	**2.4**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: S/W Lab –II (C Programming)

Course Code: A300106

Semester: 1st

L T P

Credits: 02 **0 0 4**

Course Outcomes: On successful completion of this course, the students will able to:-

CO	Statement
CO1	Identify the difference between the top-down and bottom-up approach.
CO2	Develop a given program using the basic elements like control statements.
CO3	Debug the programming code.
CO4	Implement the Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
CO5	Analyze an algorithmic solution for a given problem.

Course Contents

1.   Program to find sum of two numbers.

2.   Program to test whether an entered number is even, odd or zero.

3.   Program to test whether an entered number is prime number or not.

4.   Program to print N terms of a Fibonacci Series.

5.   Program to find the reverse of number.

6.   Program to check whether a given Number or a given string is palindrome or not.

7.   Program to reverse a given string.

8.   Program to check whether a given number is prime or not.

9.   Program to find the prime numbers up to N.

10.   Program to print:

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11.   Program to search a string in an array using read-data.

12.   Program to find the frequency of vowels in a given string.

13.   Program to find the frequency of each character in a given string.

14.   Program to find greatest in a matrix using subroutine.

15. Program for Matrices Addition and subtraction.

16. Program for Matrix Transpose.

17. Program to find sum of rows and column of a matrix.

18. Program to find sum of both diagonals of the matrix.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	3	2	3	2	3	2	-	-	2	2	3	3	3	2	2
CO2	2	2	3	1	2	1	-	-	3	2	2	3	2	3	1
CO3	2	1	2	2	1	2	-	-	2	2	2	2	3	3	3
CO4	3	3	2	2	2	3	1	-	3	2	2	2	2	2	2
CO5	2	2	1	2	1	2	-	1	2	2	2	2	3	3	1
Average	**2.4**	**2.0**	**2.2**	**1.8**	**1.8**	**2.0**	**1**	**1**	**2.4**	**2.0**	**2.2**	**2.4**	**2.6**	**2.6**	**1.8**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: Installation, Assembling and Networking of Computers (Practical)

Course Code: A300107

Semester: 1st

L T P

Credits: 02   **0 0 4**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Know the motherboard, bios and storage device features and its functions.
CO2	Install OS (Linux/windows) on their systems.
CO3	Create disk partitioning.
CO4	Install system and software applications.
CO5	Get knowledge about ports and wires.

Course Contents

1. Introduction of Hardware and Software/components of computer.
2. Mother boards, Chipsets & Microprocessor concept & latest available in market.
3. Basics &Types of Floppy drive/HDD/DVD/RAM /SMPS//BIOS.
4. Assembling of different parts of computers.
5. Knowing ports, wires attached in the Computer.
6. Installation of OS (Linux/Windows).
7. Installation of application and utility software.
8. Networking Basics: Different types of Topologies and their configuration.
9. Types of Switches, I/O Sockets.
10. Creation of Cross Wires and Direct Cables.
11. IP & Setting up a computer on LAN.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	3	2	3	3	3	2	-	1	2	2	3	2	2	1	2
CO2	2	1	3	2	2	2	-	-	3	2	3	3	3	2	1
CO3	2	2	1	3	2	3	-	1	2	2	2	2	2	1	3
CO4	2	2	3	2	2	3	-	-	3	2	3	3	1	2	3
CO5	1	3	1	1	3	2	1	1	2	2	2	2	2	3	1
Average	**2.0**	**2.0**	**2.2**	**2.2**	**2.4**	**2.4**	**1**	**1**	**2.4**	**2.0**	**2.6**	**2.4**	**2.0**	**1.8**	**2.0**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: Fundamentals of Web Technology

Course Code: A300201

Semester: 2nd

L T P

Credits: 04   **3 1 0**

Course Outcomes: On completion of this course, the students will be able to:-

CO	Statement
CO1	Attain the basic knowledge about HTML Tags, List and their types.
CO2	Create the hyper- link of documents in HTML and frames using tables.
CO3	Design the forms with various attributes like Buttons, Text Area.
CO4	Develop a web site with the use of HTML tags and CSS.
CO5	Formulate a domain name for website and upload website on a Remote Server.

Course Contents

UNIT - I

HTML: Introduction, HTML Tags, Commonly used HTML Commands, Structure of HTML Program, Formatting, Text Styles, and Text Effects

HTML: HTML Lists, Types of lists, adding graphics to HTML Document

UNIT - II

HTML: Creating tables, Linking documents, Frames

HTML Forms: Properties and Methods, Button, Text, Text Area, Checkboxes, radio buttons, select and option elements

UNIT – III

Web Development: Web site, Web page, Static Website and Dynamic Website

HTML: Web Server, Web Client/ Browser

DHTML: Cascading Style Sheets, Class, External Style Sheets

Introduction to Java Script: How& Where to put the JavaScript Code, JavaScript Statements, Comments, Variables, Operators, Control Statements, Loops, Popup Boxes, Functions.

UNIT – IV

Purchasing a Domain Name & Web Space: Domain Name & Web Space, Getting a Domain Name & Web Space (Purchase or Free), Uploading the Website to Remote Server.

Internet: Basic Concepts, Communicating on the Internet, Internet Domains, Establishing connectivity to the Internet, Client IP Address, IP Address.

Text Books:

1.   Ivan Bayros. *Web Enabled Commercial Application Development Using HTML, DHTML, Java Script, PHP*, Fourth Revised Edition, BPB publication.

2.   Wilton Paul. *Beginning Java Script*, Mc Peak Jeremy Wrox.

3.   Jones Don, Scott Mark & Villarsrick. *E-Commerce for Dummies,* Hungry Minds.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	2	3	1	3	2	-	-	2	2	3	2	2	1	2
CO2	1	2	3	2	3	2	-	-	3	2	3	3	3	2	1
CO3	3	2	1	1	2	3	-	1	2	2	2	2	2	1	3
CO4	3	3	3	3	3	2	-	-	3	2	3	3	1	2	3
CO5	1	3	3	2	3	3	1	-	2	2	2	2	2	3	1
Average	**2.0**	**2.4**	**2.6**	**1.8**	**2.8**	**2.4**	**1**	**1**	**2.4**	**2.0**	**2.6**	**2.4**	**2**	**1.8**	**2.0**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: Data Structures

Course Code: A300202

Semester: 2nd

LT P

Credits: 04　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　**3 1 0**

Course Outcomes: On successful completion of this course, the students will be able to:

CO	Statement
CO1	Applies algorithms and data structures in various real-life software problems.
CO2	Summarize the searching and sorting techniques.
CO3	Implement the stack, queue and linked list operation.
CO4	Search the trees such as binary search trees and splay trees and graphs
CO5	Analyze the elementary sorting algorithms such as Selection sort, Bubble sort, Insertion sort, and Shell sort and Searching techniques.

Course Contents

UNIT - I

Introduction: definition, various types of data structures, data structure operations, algorithms complexity and Time Space Trade-off.

Arrays and Records: Linear arrays, Representation of linear arrays in memory, Operations on Array, Multidimensional arrays and its implementation, Pointers, pointer arrays, Records.

UNIT - II

Stacks: Stacks, array representation of stacks, operation on stacks, Polish Notation, Notation conversion, evaluation of postfix expression, Applications of Stack.

Queues: Queues, implementation, operations on queue, Dequeues, Priority queues.

UNIT – III

Linked Lists: Linked lists, Representation in memory, traversing link lists, operations on link list, overflow and underflow, Memory allocation, Header link list, two way lists.

Trees: Basic terminology, Binary trees and its representation, complete binary tree, extended binary tree, linked representation of binary tree, traversing binary tree, searching binary tree, and Binary search trees.

UNIT – IV

Sorting and Searching: Definitions, bubble sort, insertion sort, selection sort, quick sort, merge sort, radix sort, heap sort, Quick Sort, Linear Search, Binary Search.

Graphs: representation of graph, types of Graph, adjacency matrices, path matrix, Graph traversal: Breadth first search. Depth first search, shortest path problem: Warshall's algorithm, Dijkstra algorithm

Text Books:

1.   Lipschutz Seymour. *Theory and Problems of Data Structures,* Schaum's series.

2.   Baluja G.S. *Data structures through C++,* PHI.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	3	2	1	3	1	2	-	-	2	2	3	2	3	2	2
CO2	2	2	2	1	2	2	-	-	3	2	3	3	2	3	2
CO3	2	2	3	3	1	2	1	-	2	3	2	2	3	3	3
CO4	1	3	1	2	2	3	-	-	3	2	3	3	2	2	1
CO5	2	2	3	3	2	3	-	1	2	3	2	2	2	3	3
Average	**2.0**	**2.2**	**2.0**	**2.4**	**1.6**	**2.4**	**1**	**1**	**2.4**	**2.4**	**2.6**	**2.4**	**2.4**	**2.6**	**2.2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: Programming using C++

Course Code: A300203

Semester: 2nd

L T P

Credits: 04　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　**3 1 0**

Course Outcomes: On successful completion of this course, the students will be able to:

CO	Statement
CO1	Learn about the programming techniques to solve problems or errors in the C++ programming language.
CO2	Compare the procedural and Object Oriented paradigms.
CO3	Attain the conceptual knowledge of array and string.
CO4	Implement the copy constructor and class member function.
CO5	Analyze the inheritance with the understanding of early binding and late binding.

Course Contents

UNIT - I

Introduction to C++: Oriented Programming, OOP Paradigm, Characteristics of OOP Language, Advantages and disadvantages of OOP over its predecessor paradigms.

Tokens: Identifier, Keywords, Constants,

Operators: Arithmetic, relational, logical, conditional and assignment.

Data Types: Variable declaration, expressions, Type conversion.

Statements: Input and output statements, stream I/O, Conditional and Iterative statements, breaking control statements.

UNIT - II

Storage Classes: Automatic, Static, Extern, Register.

Arrays: Arrays as Character Strings, Structures, Unions, Enumerations.

Functions: Prototyping, Definition and Call, Parameter Passing by value, Parameter Passing by address and Parameter Passing by reference, Constant functions, Constant and default arguments, recursion.

UNIT – III

Classes and Objects: Class Declaration and Class Definition, Defining member functions, inline functions, this pointer, Object as function arguments, array of objects, functions returning objects, Static data members and Static member functions, function overloading,

Friend functions and Friend classes. Constructors & Destructors: properties, types of constructors.

UNIT – IV

Inheritance: Defining derived classes, inheriting private members, types of inheritance, Types of base classes. Polymorphism: Methods of achieving polymorphic behavior, early binding, virtual functions, late binding, pure virtual functions and abstract base class.

Operator overloading: overloading binary and unary operator, operator overloading using friend function, function overloading.

Files and streams: Classes for file stream operations, opening and closing of files, reading and writing files.

Text Books:

1. Balagurusamy E. *Object Oriented Programming with C++,* Tata Mc Graw-Hill.

2. Lafore Robert. *Object Oriented Programming in C++,* Galgotia Publications.

3. Schildt Herbert. *The Complete Reference C++,* Tata Mc Graw-Hill

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	3	2	3	2	1	3	-	1	2	2	3	2	2	3	3
CO2	2	1	2	1	3	2	-	-	3	2	3	3	3	2	3
CO3	2	2	1	2	1	2	-	-	2	3	2	2	3	1	2
CO4	1	2	2	3	1	1	1	-	3	2	3	3	2	2	1
CO5	2	1	3	3	1	2	-	1	2	2	2	2	1	1	2
Average	**2.0**	**1.6**	**2.2**	**2.2**	**1.4**	**2.0**	**1**	**1**	**2.4**	**2.2**	**2.6**	**2.4**	**2.2**	**1.8**	**2.2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: Communication Skills-II

Course Code: A300204

Semester: 2nd

L T P

Credits: 04   **3 1 0**

Course Outcomes: On successful completion of this course, the students will be able to:

CO	Statement
CO1	Take a course overview of prerequisites to Business Communication and awareness of appropriate communication strategies.
CO2	Formulate an outline for effective Organizational Communication.
CO3	Summarize the information, ideas, concepts and opinions from a variety of sources.
CO4	Attain the competence in oral, written, and visual communication.
CO5	Learn the correct practices about the strategies of Effective Business writing.

Course Contents

UNIT - I

Introduction to Business Communication: Meaning and Definition; process and classification of communication; elements &characteristics of communication; barriers to effective communication in business organization; Formal and Informal communication; grapevine, importance of effective communication in business house; Principals of effective communication

UNIT - II

Writing Skills: Inter-office memorandums; faxes; E-mails; writing effective sales letters - to agents; suppliers; customers; report writing; project writing

UNIT – III

Curriculum Vitae (CV): Drafting a CV; writing job application and other applications; do's and don'ts while appearing for an Interview; types of interview.

UNIT – IV

Presentation Skills: Introduction; need of good presentation skills in professional life; preparing a good presentation; group discussion; extempore speaking.

Text Book:

1.   Rodriguez M.V. *Effective Business Communication*.

2.   Allen W. Standard. *Living English Structure*, Orient Longman.

3.   Raman Meenakshi and Singh Parkash. *Business Communication*,   Paperback Edition,

Oxford University Press.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	3	1	1	2	2	2	-	1	2	3	3	2	2	3	3
CO2	2	2	1	2	2	1	-	1	3	3	3	3	3	2	3
CO3	3	2	3	2	1	2	1	1	2	3	2	2	3	1	2
CO4	3	2	3	1	3	3	-	1	3	3	3	3	2	2	1
CO5	2	3	3	2	1	2	-	1	2	3	2	2	1	1	2
Average	2.6	2.0	2.2	1.8	1.8	2.0	1	1	2.4	3	2.6	2.4	2.2	1.8	2.2

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.

Course Name: Software Lab- III (Programming using C++)

Course Code: A300205

Semester: 2nd

L T P

Credits: 03   **0 0 6**

Course Outcomes: On successful completion of this course, the students will be able to:

CO	Statement
CO1	Classify the object oriented concepts and their implementation.
CO2	Use the concepts of array and string using C++.
CO3	Implement a given program solved by C++.
CO4	Grasp the concept of implementing the constructors with classes.
CO5	Apply algorithmic problems including inheritance, and polymorphism with the understanding of early and late binding, usage of exception handling, generic programming.

Course Contents

1.   Write a program to print 1

12

123

1234

123452.

2.   Write a program to print 1

22

333

4444

55555

3.   Write a program generates the prime numbers.

4.   Write a program addition of two square matrices.

5.   Write a program multiplication of two matrices.

6.   Write a program to subtract two matrices.

7.   Write a program to find whether the number is even, odd.

8.   Write a program to find greatest out of three number using &&operators.

9.   Write a program to find whether the number is palindrome or not.

10.   Write a program to print even number Series.

11. Write a program to print odd number Series.

12. Write a program to print prime number Series.

13. Write a program to find whether the number is prime or composite.

14. Write a program to find length of given Character string.

15. Write a program to find the reverse of number.

16. Write a program to add string2 into string1.

17. Write a program to compare two strings.

18. Write a program to copy sring2 intostring1.

19. Write a program to find volume of (I) cylinder (II) cone.

20. Write a program to find factorial of number.

21. Write a program to add, multiply, subtract, divide two numbers using nested if-else in C++.

22. Write a program to implement switch case in C++.

23. Write a program to implement for loop, while loop and do-while loop in C++.

24. Write a program to enter record of 50students.

25. Write a program to implement call by value.

26. Write a program to show call by reference in C++.

27. Write a program to create structure in C++.

28. Write a program to find the area of circle, rectangle and polygon by using structure.

29. Write a program to create classes in C++.

30. Write a program that uses a class where the member functions are defined inside a class.

31. Write a program that uses a class where the member function share defined outside a class.

32. Write a program to demonstrate the use of static data members.

33. Write a program to demonstrate the use of keyword const data members.

34. Write a program using constructors in C++.

35. Write a program using destructors in C++.

36. Write a program using multiple constructors in C++.

37. Write a program using Copy constructor in C++.

38. Write a program to demonstrate the single inheritance.

39. Write a program to demonstrate the multilevel inheritance.

40. Write a program to demonstrate the multiple inheritances.

41. Write a program showing hierarchal inheritance in C++.

42.   Write a program to implement function overloading.

43.   Write a program to demonstrate the overloading of binary arithmetic operators.

44.   Write a program showing operator overloading in C++.

45.   Write a program to demonstrate the use of function template.

46.   Write a program to demonstrate the use of class template.

47.   Write a program showing Exception handling in C++.

48.   Write a program to read and write data from a file in C++.

49.   Write a program to demonstrate the reading and writing of mixed type of data.

50.   Write a program to demonstrate the reading and writing of objects.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	3	2	3	2	1	2	-	-	2	2	3	2	2	3	1
CO2	1	1	2	1	2	2	1	-	3	2	3	3	2	2	3
CO3	2	2	1	2	2	3	-	-	2	3	2	2	2	3	2
CO4	1	2	2	3	3	2	-	1	3	2	3	3	3	2	1
CO5	2	1	3	1	2	2	-	-	2	2	2	2	2	2	3
Average	**1.8**	**1.6**	**2.2**	**1.8**	**2.0**	**2.2**	**1**	**1**	**2.4**	**2.2**	**2.6**	**2.4**	**2.2**	**2.4**	**2.0**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.

Course Name: S/W Lab-IV (Data Structures)

Course Code: A300206

Semester: 2nd

L T P

Credits: 02   **0 0 4**

Course Outcomes: On successful completion of this course, the students will be able to:

CO	Statement
CO1	Identify the time and space complexity of the data structures.
CO2	Perform Programs to demonstrate the implementation of various operations on stack and queue.
CO3	Implement the various sorting / searching techniques.
CO4	Solve the Algorithmic problems like insertion and deletion of data.
CO5	Gain knowledge about the applications of data structures.

Course Contents

1.   Write a program to insert an element into an array

2.   Write a program to delete an element from an array.

3.   Write a program to implement linear search algorithm

4.   Write a program to implement binary search algorithm

5.   Write a program to implement bubble sort algorithm.

6.   Write a program to implement selection sort algorithm.

7.   Write a program to implement PUSH operation in stacks.

8.   Write a program to implement POP operation in stacks.

9.   Write a program to implement Queues.

10.   Write a program to insert an element in the beginning of the link list.

11.   Write a program to insert an element in the middle of the link list.

12.   Write a program to insert an element in the end of the link list.

13.   Write a program to delete an element from the beginning of the link list.

14.   Write a program to delete an element from the end of the link list.

15.   Write a program for implementation of a graph.

16.   Write a program for implementation of binary search tree.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	3	2	3	2	3	2	-	1	2	2	3	2	2	1	3
CO2	1	1	1	1	2	2	-	-	3	2	3	3	2	2	2
CO3	2	3	1	2	2	2	-	1	2	3	2	2	1	3	1
CO4	1	2	2	3	2	1	1	-	3	2	3	3	2	1	3
CO5	2	1	3	1	3	3	-	-	2	2	2	2	1	2	3
Average	**1.8**	**1.8**	**2.0**	**1.8**	**2.4**	**2.0**	**1**	**1**	**2.4**	**2.2**	**2.6**	**2.4**	**1.6**	**1.8**	**2.4**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.

`Course Name: S/W Lab-V (Fundamentals of Web Technology)

Course Code: A300207

Semester: 2nd

L T P

Credits: 02   **0 0 4**

Course Outcomes: On successful completion of this course, the students will be able to:

CO	Statement
CO1	Learn about an overview about HTML Tags and serve let operations in DBMS.
CO2	Create web pages using XHTML and Cascading Style Sheets.
CO3	Build dynamic web pages using JavaScript (Client side programming).
CO4	Analyze a web page and identify its elements and attributes in HTML.
CO5	Create the domain name for a website and on the remote side.

Course Contents

1   Design the page with an attractive background color, text color and background image.

2.   Design the page with an attractive color combination, with suitable headings and horizontal rules.

3.   Write an HTML document with an example of Ordered List and Unordered List.

4.   Write an HTML document with an example of Table format to print your Bio-Data.

5.   Write an HTML document with an example of Table format to print your Telephone Bill.

6.   Develop a complete web page using Frames and Frameset.

7.   Write an HTML code for designing the subscription form of mail account in the e-mail website with appropriate fields.

8.   Write an example of Style Sheet.

9.   Design a webpage with colors in bgcolor, text and link, try out different sizes.

10.   Design a single page web site for a university containing a description of the courses offered, it should also contain some general information about the university such as its history.

11.   Write a HTML code for specifying the heading BS or cities in the HTML document.

12.   Write a HTML Code for Nested list.

13.   Write HTML code to develop a web page having background in blue and title "Welcome to my home page" in red other color.

14. Create an HTML document of giving details of your name, age, and telephone no, address and enrolment no, aligned in proper order.

15. Design a web page that provides links to five different web pages or to entirely different websites.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	2	2	3	1	2	-	-	2	2	3	2	2	3	1
CO2	3	1	2	1	2	2	-	-	3	2	3	2	1	2	3
CO3	2	2	3	3	3	1	`1	-	2	2	2	2	3	3	2
CO4	3	2	2	2	1	2	-	1	3	2	3	3	3	3	1
CO5	2	2	2	3	1	1	-	-	2	3	2	2	3	1	2
Average	2.4	1.8	2.2	2.4	1.6	1.6	1	1	2.4	2.2	2.6	2.2	2.4	2.4	1.8

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: Digital Electronics

Course Code: A300301

Semester: 3rd

L T P

Credits: 04   **4 0 0**

Course Outcomes: On successful completion of this course, the students will be able to:

CO	Statement
CO1	Classify the fundamental concepts and techniques used in digital electronics.
CO2	Apply the principles of number system, binary codes and Boolean algebra to minimize logic expressions.
CO3	Know the difference of combinational and sequential circuits.
CO4	Identify the basic requirements for designing an application.
CO5	Analyze the various hazards in a digital design.

Course Contents

UNIT - I

Introduction: Overview of number system and codes. Elements and functions of digital Logic gates, Gate propagation delay time, logic gates applications.

UNIT - II

Boolean algebra: Boolean operations, SOP and POS forms, Detection and correction codes, detecting and correcting an error.

UNIT – III

Combinational logical circuits: design of Binary Adder, Serial, Parallel, Carry look ahead type, Full subtractor, code converters, MUX and DEMUX, encoders and encoders. Sequential logic circuits: Flip flop: RS, JK, Bachelor slave JK, D and T flip-flops using NAND gates.

UNIT – IV

Counters: Design of asynchronous and synchronous, up down and programmable counters. Registers: shift registers, various types and their applications.

Text Books:

1. Mano D. and Morris. *Digital Circuits of Logic Design,* PHI.
2. Bartee, T.C. *Digital and Electronic Circuits,* Mc Graw Hill.
3. Malvino. *Digital Computer Electronics,* Career Education.
4. Floyd T.L. *Digital Fundamentals,* Pearson Education.
5. Jain R.P. *Modern Digital Electronics,* Mc Graw Hill Education India.

6. Tauls and Schillings. *Digital Integrated Electronics,* Mc Graw-Hill Education.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	3	3	2	2	2	2	-	-	2	2	3	2	2	2	2
CO2	3	2	2	3	2	1	-	-	3	2	3	3	3	3	2
CO3	3	3	1	1	2	2	1	-	2	2	2	2	2	3	3
CO4	3	2	3	2	2	2	-	1	3	2	3	3	3	2	1
CO5	2	3	2	2	3	2	-	-	2	3	2	2	3	2	2
Average	2.8	2.6	2.0	2.0	2.2	1.8	1	1	2.4	2.2	2.6	2.4	2.6	2.4	2.0

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.
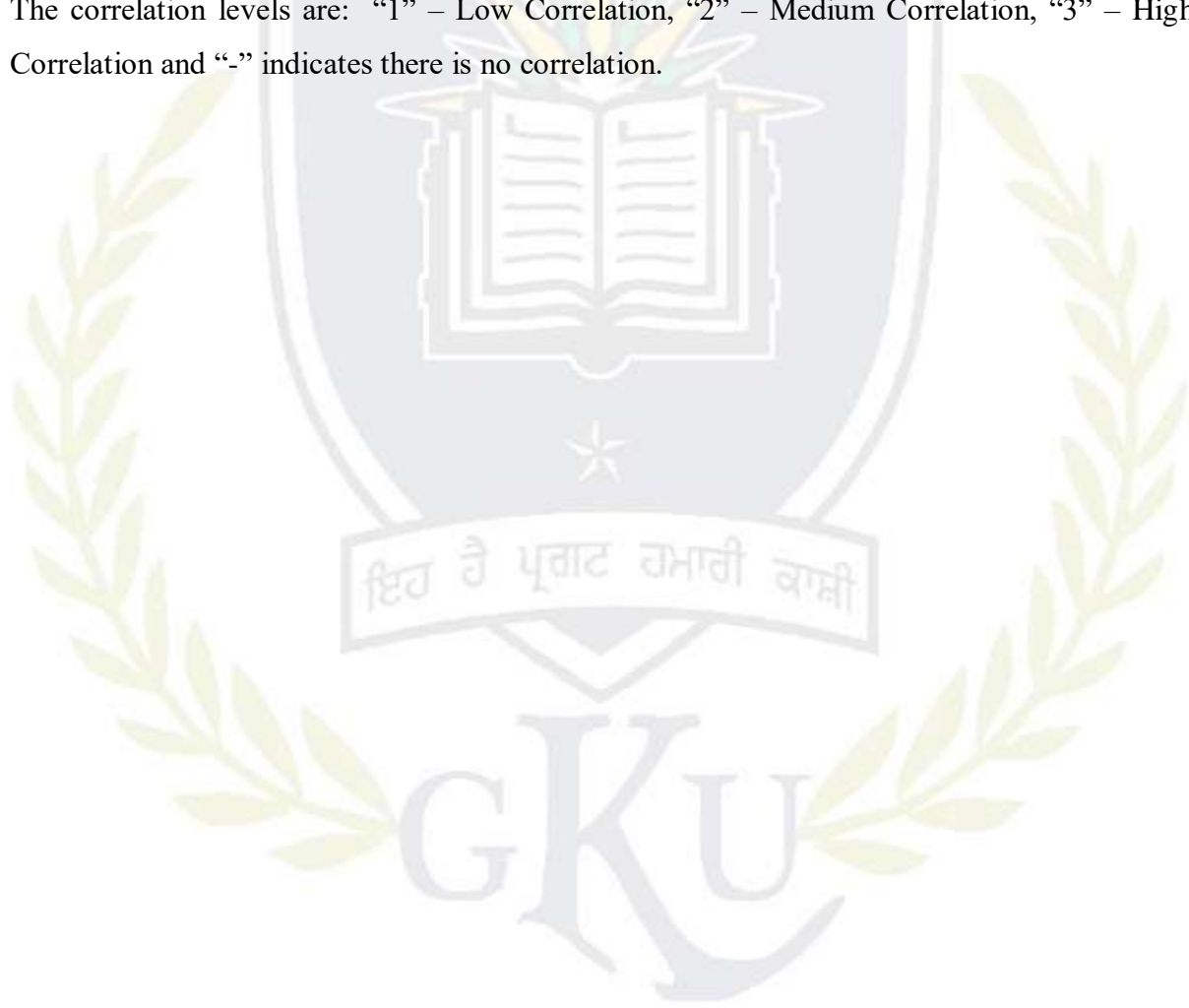
Course Name: Math I (Discrete Mathematics)

Course Code: A300302

Semester: 3rd

L T P

Credits: 04   **4 0 0**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Implement the Logical and Algebraic operations.
CO2	Understand the basic principles of relation in a set.
CO3	Solve the various methods of Recurrence relations.
CO4	Perform operations on sets, functions, relations, and sequences.
CO5	Apply algorithms and use of graphs and trees as tools to simplify Problems.

Course Contents

UNIT - I

Set theory, Relations and functions: Set notations and description, subsets, basic set operations. Venn diagrams, laws of set theory, partition of sets, min sets, duality principle, basic definitions of relations and functions, graphics of relations, properties of relations; injective, subjective and bijective functions, composition.

UNIT - II

Combinations: Rule of products, permutations, combinations. Algebra of Logic: Propositions and logic operations, truth tables and propositions generated by set, equivalence and implication laws of logic, mathematical system, and propositions over a universe, mathematical induction, quantifiers.

UNIT – III

Recursion and recurrence: The many faces of recursion, recurrence, relations, and some common recurrence relations, generating functions.

UNIT – IV

Graph theory: Various types of graphics, simple and multigraphs, directed and undirected graphs, Eulerian and Hamiltonian graph, graph connectivity, traversals, graph optimizations, Graph coloring , trees, spanning trees, rooted trees, binary trees.

Text Books:

1. Doerr A. & Kenneth L. *Applied Discrete Structure of Computer Science,* Galgotia Publications.

2. Swami M.N.S and Thisiraman E. *Graphics Networks and Algorithms*, John Wiley & Sons.

3. Tremblay J.P and Manohar R. *Discrete Mathematical Structure with Application to Computer Science*, Mc Graw Hill.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	3	2	2	3	2	3	-	-	2	2	3	2	2	2	1
CO2	1	2	2	2	2	2	-	-	3	2	3	3	3	3	2
CO3	1	2	3	2	1	3	-	-	2	3	2	2	2	3	3
CO4	2	2	3	1	3	2	1	-	3	2	3	3	3	2	2
CO5	3	1	1	2	1	2	-	-	2	3	2	2	2	3	3
Average	2.0	1.8	2.2	2.0	1.8	2.4	1	1	2.4	2.4	2.6	2.4	2.4	2.6	2.2

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: Operating System

Course Code: A300303

Semester: 3rd

L T P

Credits: 04   **4 0 0**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Study the fundamental concepts of Operating System.
CO2	Solve the various types of Scheduling Algorithms for better utilization of external memory.
CO3	Learn about the mechanism of memory management in OS.
CO4	Attain the knowledge about deadlock detection algorithms.
CO5	Understand the components and aspects of concurrency management.

Course Contents

UNIT - I

Introduction to Operating System: its need and Operating System services; Operating System classification , single user, multiuser, simple batch processing, Multiprogramming, Multitasking, Parallel system, Distributed system, Real time system.

UNIT - II

Process Management: Process Concept, Process scheduling.

CPU Scheduling: Basic concepts, Scheduling Criteria, Scheduling Algorithms.

UNIT – III

Memory Management: Logical Versus Physical addresses space, Swapping Partition, paging and segmentation, concepts of Virtual Memory.

File Management: File concept, access methods, Directory Structure, file protection. Allocation methods: Contiguous, linked and index allocation.

UNIT – IV

Deadlocks: Deadlock Characteristics, Prevention, Avoidance, Detection and Recovery, critical section, semaphores, combined approach to deadlock handling.

Security: Authentication, Program Threats, System Threats, and Encryption.

Text Books:

1. Silberschatz Galvin. *Operating System Concepts,* John Wiley & Sons Inc.

2. Milan Milenkovic. *Operating System*, McGraw Hill Education.

3. Deital H.M. *An Introduction to Operating System,* Addison Wesley.

4. Stalling W. *Operating System,* PHI.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	3	2	3	-	-	2	2	3	2	3	2	3
CO2	1	1	2	2	2	3	-	1	3	3	2	3	2	2	1
CO3	1	2	3	1	1	3	-	-	2	2	2	2	2	3	3
CO4	2	2	3	1	3	2	1	-	3	2	2	3	2	2	2
CO5	3	1	1	2	1	2	-	-	2	2	2	2	2	2	3
Average	**2.0**	**1.6**	**2.4**	**1.8**	**1.8**	**2.6**	**1**	**1**	**2.4**	**2.2**	**2.2**	**2.4**	**2.4**	**2.2**	**2.4**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.

Course Name: Systems Analysis and Design

Course Code: A300304

Semester: 3rd

L T P

Credits: 04   **4 0 0**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Understand the life cycle of a systems development project.
CO2	Attain knowledge about the structural designs and their concepts.
CO3	Draw the various types of data flow diagrams.
CO4	Identify a wide range of problems related to the analysis and design of information system.
CO5	Develop team-building and communication skills for successful completion of projects.

Course Contents

UNIT - I

System Concepts: Definition, characteristics, elements & types of system.

System development life cycle: Recognition of need: Feasibility study, system analysis, introduction

UNIT - II

Structure design and Fact finding Techniques: Information collection, interviews, questionnaires, observation, record searching and document analysis, analysis tools, data flow diagram, data dictionary, decision tree, structured English and decision table.

UNIT – III

System Design: The process and stages of systems design, input/output and file design;

UNIT – IV

System Implementation: System implementation, system testing, implementation process and implementation methods, system maintenance.

Text Books:

1. Awad Elias N. *System Analysis and Design*, Galgotia Publications.

2. Sen James A. *Analysis and Design of Information System,* Tata McGraw Hill.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3

CO1	3	2	3	1	3	3	1	-	2	2	3	2	2	3	2
CO2	2	2	1	3	2	3	-	-	3	3	3	3	3	2	1
CO3	2	3	3	2	1	2	1	-	2	2	2	2	2	3	3
CO4	2	2	3	2	1	2	-	1	3	3	3	3	3	2	1
CO5	3	1	2	3	3	2	-	-	2	2	2	2	2	3	3
Average	**2.4**	**2.0**	**2.4**	**2.2**	**2.0**	**2.4**	**1**	**1**	**2.4**	**2.4**	**2.6**	**2.4**	**2.4**	**2.6**	**2.0**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.

Choice Based Course-I

Course Name: Basics of Travel & Tourism

Course Code: CB100325

Semester: 3rd

Credits: 03

L T P

3 0 0

Course Outcomes: On successful completion of this course, the students will be able to

CO	Statement
CO1	Learn about the basic concepts of travel and tourism.
CO2	Give an insight into how travel and tourism evolved over a period of time and reached the modern stage.
CO3	Enhance the knowledge in various areas related to tourism and how it affects the destination.
CO4	Identify the selected issues that currently influence the tourism industry both locally and globally.
CO5	Run the applications of Basics of Travel & Tourism.

Course Contents

UNIT I

The tourism phenomenon: Definition- tourism; tourist; visitor; excursionist; domestic; international; inbound; out band; destination, Growth of tourism/evolution/history of tourism & present status of tourism in India, Thomas cooks grand circular tour

UNIT II

Infrastructure of tourism: Role of transport in tourism, Modes of transport- road, rail, area, sea, Types of accommodation- main & supplementary

UNIT III

Types of tourism: Types of tourism: various motivators holiday, social & cultural, MICE religious, VFR (visiting friends and relatives) sports, political, health, senior citizen sustainable tourism, Alternative tourism: Eco tourism, agro rural tourism

UNIT IV

The travel agency: Meaning & definition of travel agent, Types of travel agent: retail & wholesale, Functions of travel agent, Provisions of travel information, Ticketing, Itinerary preparation, Planning & costing, Settling of accounts, Liaisons with service providers, Role of travel agent in promotion of tourism

UNIT V

The tour operator: Meaning & definition, Types of tour operator: inbound, outbound & domestic, Tour packaging- definition, components of a tour package, Types packaging tour: Independent tour, Inclusive tour, Escorted tour, Business tour, Guide & escorts- their role and function qualities required to be a guide or escort

UNIT VI

Travel formalities & regulations: Passport- definitions, issuing authority, types of passport, requirements for passport, Visa- definition, issuing authority, types of visa, requirements for visa, Health regulation- vaccination, health insurance, Economic regulation- foreigner exchange

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	1	1	1	2	3	2	3	3	3	2	2	2	2
CO2	1	1	2	1	1	1	3	2	3	3	3	2	3	3	1
CO3	1	-	2	2	1	2	1	3	3	3	2	2	2	3	3
CO4	1	1	2	1	2	3	-	3	3	2	3	3	1	3	3
CO5	1	2	2	2	2	2	3	2	2	2	2	2	3	2	2
Average	**1**	**1.33**	**1.8**	**1.4**	**1.4**	**2.0**	**2.5**	**2.6**	**2.8**	**2.6**	**2.6**	**2.2**	**2.2**	**2.6**	**2.8**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Choice Based Course-I

Course Name: Introduction to Facilities Planning

Course Code: CB100328

Semester: 4th

Credits - 03   **L T P**

3 0 0

Course Outcomes: On successful completion of this course, the students will be able to

CO	Statement
CO1	Understand the key FM functions and responsibilities.
CO2	Identify the key business challenges of FM.
CO3	Become familiar with some of the FM tools and techniques.
CO4	Attain the knowledge about Planning environment.
CO5	Use the applications of Facility Planning.

Course Contents

UNIT-I

Hotel Design: Design Consideration, Attractive Appearance, Efficient Plan, Good location, Suitable material, Good workmanship, Sound financing, Competent Management.

Facilities Planning: The systematic layout planning pattern (SLP)

Planning consideration, Flow process & Flow diagram, Procedure for determining space considering the guiding factors for guest room/ public facilities, support facilities & services.

Architectural consideration, Difference between carpet area plinth area and super built area, their relationships, reading of blue print (plumbing, electrical, AC, ventilation, FSI, FAR, public Areas), Approximate cost of construction estimation, Approximate operating areas in budget type/5 star type hotel approximate other operating areas per guest room, Approximate requirement and Estimation of water/electrical load gas, ventilation.

UNIT-II

Star Classification of Hotel: Criteria for star classification of hotel (Five, four, three, two, one & heritage).

Kitchen Layout& Design: Principles of kitchen layout and design, Areas of the various kitchens with recommended dimension, Factors that affect kitchen design, Placement of equipment, Flow of work, Space allocation, Kitchen equipment, manufacturers and selection,

Layout of commercial kitchen (types, drawing a layout of a Commercial kitchen), Budgeting for kitchen equipment

UNIT-III

Stores Layout and Design: Stores layout and planning (dry, cold and bar) various equipment of the stores, Work flow in stores

UNIT-IV

Car Parking: Calculation of car park area for different types of hotels.

Planning for Physically Challenged Project Management: Introduction to Network analysis, Basic rules and procedure for network analysis, C.P.M. and PERT, Comparison of CPM and PERT, Classroom exercises, Network crashing determining crash cost, normal cost.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	1	1	1	2	3	2	3	3	3	2	2	2	2
CO2	1	2	2	1	1	1	3	3	3	3	3	2	3	3	1
CO3	1	2	2	2	1	2	-	3	3	2	2	2	2	3	3
CO4	1	1	2	1	2	3	2	3	3	2	3	3	1	3	3
CO5	1	2	2	2	2	2	3	-	2	2	2	2	3	2	2
Average	**1**	**1.8**	**1.8**	**1.4**	**1.4**	**2.0**	**2.7**	**2.7**	**2.8**	**2.8**	**2.6**	**2.2**	**2.2**	**2.6**	**2.8**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: Marketing Management

Course Code: CB100333

Semester: 3rd

L T P

Credits: 03 **3 0 0**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Understand the concepts of marketing management.
CO2	Learn about marketing process for different types of products and services.
CO3	Use the tools used by marketing managers in decision situations.
CO4	Adapt the marketing environment.
CO5	Utilize the applications of marketing management.

Course Contents

UNIT - I

Nature and scope of marketing: corporate orientation towards marketplace; building and delivering customer value and satisfaction; retaining customers; Marketing Mix, marketing environment; marketing research and information system.

UNIT - II

Analyzing consumer markets and buyer behavior: analyzing business markets and business buying behavior; market segmentation, positioning and targeting; tools of product differentiation; marketing strategies in the different stage of the product life cycle; Retail Marketing Concept

UNIT – III

New product development process: product mix and product line decisions; branding and packaging decisions; pricing strategies and programs; managing marketing channels; wholesaling and retailing.

UNIT – IV

Advertising and sales promotion: public relations; personal selling; evaluation and control of marketing effort; internet marketing; green marketing; reasons for and benefits of going international; entry strategies in international marketing.

Text Book:

1. Kotler Philip and Keller. *Marketing Management,* PHI, New Delhi Kotler, Philip, Kevin Keller,

2. A. Koshy and M. Jha. *Marketing Management in South Asian Perspective* Pearson Education, New Delhi.

3. Hartley, Berkowtz and Rudelius. *Marketing*, TMH, New Delhi.

4. Etzel and Michael J. *Marketing: Concepts and Cases**, TMH, New Delhi.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	1	2	-	-	2	2	3	2	2	2	2
CO2	1	2	2	3	2	1	-	-	3	2	3	3	3	3	1
CO3	3	3	2	1	2	2	-	1	2	2	2	2	2	3	3
CO4	3	1	1	3	2	3	1	-	3	2	3	3	1	3	3
CO5	3	2	2	2	2	2	-	-	2	2	2	2	3	2	2
Average	**2.6**	**2.2**	**1.8**	**2.2**	**1.8**	**2.0**	**1**	**1**	**2.4**	**2.0**	**2.6**	**2.4**	**2.2**	**2.6**	**2.8**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: H/W Lab-VI (Digital Electronics)

Course Code: A300305

Semester: 3rd

L T P

Credits: 04   **0 0 8**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Compare analog and digital system.
CO2	Identify the various digital ICs and their operations.
CO3	Apply Boolean laws to simplify the digital circuits.
CO4	Design the various logic circuits.
CO5	Learn troubleshoot problems in digital circuits.

Course Contents

UNIT - I

Note: A subset of following experiments has to perform.

1. To study the functions of basic logic gates and verify the truth table of AND, OR, NOT, XOR, NAND, NOR.

2. To study applications of AND, OR, NAND, XOR gates for gating digital signals.

3. To develop the different Arithmetic Circuits:

   a. Half Adder and Subtractor

   b. Full Adder and Subtractor

4. To study the BCD to binary and binary to BCD Code converter.

5. Study of Decoder Circuits: a. BCD to Decimal Decoder b. BCD to 7 Segment Decoder

6. Study of Encoder Circuits: a. BCD to Decimal Encoder b. Octal to Binary Encoder

7. To study the flip flop circuit using Gates: a. R S Flip Flop b. J K Flip Flop c. Bachelor Slave J K Flip Flop d. D Flip Flop

8. To study the R S & J K and D Flip Flop Using IC"s

9. Study of Shift Register.

10. Study of Ring Counter.

11. Study of Asynchronous and Synchronous Counters.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	3	3	2	2	1	2	-	-	2	2	3	2	2	2	3
CO2	1	2	2	3	2	1	-	-	3	2	3	3	3	3	1
CO3	3	3	2	1	3	2	1	-	2	2	2	2	2	3	3
CO4	2	1	1	3	2	3	-	-	3	2	3	3	2	3	3
CO5	3	2	2	2	2	2	-	-	2	2	2	2	3	2	2
Average	**2.4**	**2.2**	**1.8**	**2.2**	**2.0**	**2.0**	**1**	**-**	**2.4**	**2.0**	**2.6**	**2.4**	**2.4**	**2.6**	**2.4**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.

Course Name: S/W Lab VII OS Lab

Course Code: A300306

Semester: 3rd

L T P

Credits: 04   **0 0 8**

Course Outcomes: On successful completion of this course, the students will be able to:

CO	Statement
CO1	Get expertise on Unix OS platform.
CO2	Develop and debug C programs created on UNIX platforms.
CO3	Install the standard libraries of Operating System.
CO4	Classify the Shell Programming in Linux.
CO5	Perform the Text related commands.

Course Contents

1) Write down the Steps to Install Linux Operating System.

2) Write down the Steps to Install XP Operating System.

3) Write and explain the File Related commands.

4) Write and explain the Directory Related commands.

5) Write and explain the Process and status information commands.

6) Write and explain the Text related commands.

7) Write and explain the command to set the File Permissions.

8) Write a shell Program for Numerical Calculations in Linux.

9) Write a shell program to create a table in Linux.

10) Write a shell program to identify Even and Odd Number in Linux.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	2	2	2	-	-	2	2	3	2	3	2	1
CO2	2	3	2	1	2	2	-	-	3	2	3	3	2	3	2
CO3	1	2	2	2	1	3	-	1	2	2	2	2	1	2	2
CO4	3	1	3	3	3	1	1	-	3	1	3	3	3	1	3
CO5	3	2	3	1	3	2	-	-	2	2	2	2	3	2	3
Average	2.4	2.0	2.2	1.8	2.2	2.0	1	1	2.4	1.8	2.6	2.4	2.4	2.0	2.2

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.

Course Name: Computer System Architecture

Course Code: A300401

Semester: 4th

L T P

Credits: 05   **4 1 0**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Learn about the architecture of central processing unit.
CO2	Attain the knowledge of memory hierarchy.
CO3	Exemplify various data transfer modes.
CO4	Use the appropriate tools to design verify and test the architecture of microprocessor.
CO5	Know about the concepts of Memory mapping and Cache memory.

Course Contents

UNIT - I

Introduction to Computer Organization & Design: Computer Organization, computer design, Computer Architecture, Instruction codes, op-codes, Computer Registers, Common Bus System, Computer Instructions, Timing and Control, Instruction Cycle, Memory reference instructions CPU: Stack Organization, Addressing Mode.

UNIT - II

Control Unit Architecture: I/O Architecture: Transfer of Information among I/O devices, I/O Bus and memory Modules, I/O versus Memory Bus, Isolated versus Memory Mapped I/O

UNIT – III

Data Transfer Modes: Asynchronous data transfer Modes of Transfer, DMA, Input output Processor, CPU, Memory and I/O ports.

UNIT – IV

Memory System: Storage technologies, Memory hierarchy, Memory mapping, Main memory and Auxiliary memory, Associative and Cache memory, Introductory study of 8 bit Microprocessor

Text Books:

1. Mano M.M. *Computer System Architecture,* PHI.

2. Hayes J.P. *Computer Organization and Architecture*, TMH.

3. Stallings. *Computer System Architecture,* PHI.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	3	1	1	3	1	2	-	-	2	2	3	2	1	1	1
CO2	3	2	3	2	1	2	-	-	3	2	3	3	2	2	3
CO3	3	2	2	3	1	1	1	-	2	2	2	2	3	2	2
CO4	3	2	2	2	3	3	-	1	3	3	3	3	3	2	2
CO5	2	3	3	2	2	1	-	-	2	2	2	2	1	3	3
Average	**2.8**	**2**	**2.2**	**2.4**	**1.6**	**1.8**	**1**	**1**	**2.4**	**2.2**	**2.6**	**2.4**	**2.0**	**2.0**	**2.2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.

Course Name: Database Management System

Course Code: A300402

Semester: 4th

L T P

Credits: 05   **4 1 0**

Course Outcomes: On successful completion of this course, the students will be able to:

CO	Statement
CO1	Identify the difference about database systems from the file systems by enumerating their features.
CO2	Acknowledge the role of the database administrator.
CO3	Retain the knowledge about physical and logical database designs.
CO4	Learn about three level architecture of database system.
CO5	Converts an Entity-Relationship diagram to Relational Schema.

Course Contents

UNIT - I

An overview of the DBMS: Concept of database system, Database Administrator and his responsibilities. Physical and Logical data independence, three levels Architecture of database system: The external level, conceptual level and the internal level.

UNIT - II

Introduction to Data Models: Entity Relationship Model, Hierarchical, Network and Relational Model, Comparison of Network, Hierarchical and Relational Model.

UNIT – III

Relational data model: Relational database, relational algebra and calculus, SQL dependencies, functional, multi valued and join, Normalization.

UNIT – IV

Database protection: Recovery, concurrency, security, integrity and control. Distribute database: Structure of distributed database, design of distributed databases.

Text Books:

1. Date C.J. *An Introduction to Data Base Systems,* Narosa Publications.

2. Korth F. Henry.*Database System Concepts*, Mc Graw Hill.

3. Prakash Naveen.*Introduction to Database Management,* TMH.

4. Desai C. Bipin.*An Introduction to Database System,* Galgotia Publications.

5. Ullman. *Principles of Database Systems,* Galgotia Publications.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	2	1	2	1	2	-	-	2	2	3	2	2	2	1
CO2	1	2	2	2	1	3	1	-	3	2	3	3	1	2	2
CO3	2	3	3	2	2	2	-	1	2	3	2	2	2	3	3
CO4	2	3	3	2	2	1	-	-	3	2	3	3	2	3	1
CO5	3	1	3	2	3	2	-	-	2	3	2	2	3	1	3
Average	**2.0**	**2.2**	**2.4**	**2.0**	**1.2**	**2.0**	**1**	**1**	**2.4**	**2.4**	**2.6**	**2.4**	**2**	**2.2**	**2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.
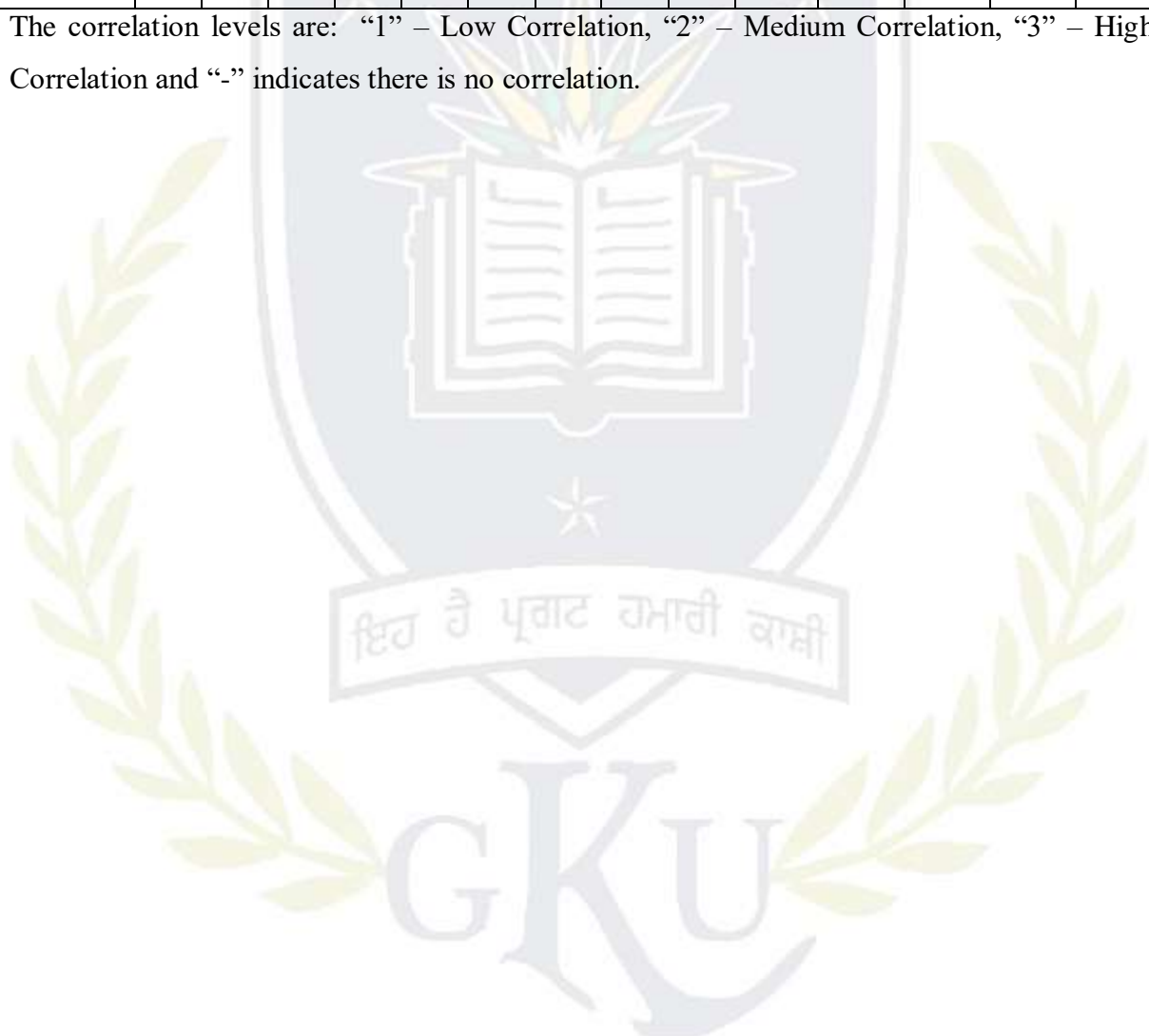
Course Name: E-Commerce and Governance

Course Code: 300407

Semester: 4th

L T P

Credits: 04   **4 0 0**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Understand the basic concepts and technologies used in the field of E-Commerce and Governance.
CO2	Gain the knowledge about the different types of Electronic Payment Systems.
CO3	Define various types of Governance Process Models.
CO4	Know about the ethical, social and security issues of online transactions.
CO5	Learn the Internet trading relationships including Business to Consumer, Business-to Business, Intra-organizational.

Course Contents

UNIT - I

Introduction to E-commerce: Introduction, E-commerce or Electronic Commerce- An Overview, Advantages and Disadvantage of E-commerce, E-commerce versus traditional commerce.

E-Commerce Process Models: Introduction, Business Models, E-business Models Based on the Relationship of Transaction Parties, e-commerce Sales Life Cycle (ESLC) Model

UNIT - II

E-Payment Systems: B2B Electronic Payments, Third-Party Payment Processing, Electronic Payment Gateway–Security Standard for Electronic Payment System.

E-Marketing: Challenges of Traditional Marketing, Retailing in E-Business Space, Internet Marketing, Advertisement and Display on the Internet, E-Business for Service Industry.

UNIT – III

Introduction to E-Governance: Introduction of E-Governance, Role of ICT's in e-governance, Need, Importance of E- governance.

Governance Process Models: Categories of E-Governance, Key issues of E-Governance, E-Governance Models, Model of Digital Governance, Critical flow model, Government–to-Citizen-to-Government Model (G2C2G)

UNIT – IV

Public Grievances: Telephone, Ration Card, Transportation, Rural services Land Records, Police: FIR registration, Lost and Found, Social Services: Death, Domicile, and School Certificate

Public Information: Employment, Hospitals, Railway, Agricultural sector: Fertilizers, seeds, water, Commercial: Income tax, custom duty, Stages in Evolution and strategies for success, Challenges against E –Governance.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	1	3	1	1	2	2	-	-	2	2	3	2	1	2	1
CO2	1	2	2	2	1	3	-	-	3	1	3	3	1	2	2
CO3	2	3	3	2	2	2	-	-	2	2	2	2	2	3	3
CO4	2	3	1	2	2	1	1	-	3	2	3	3	2	3	1
CO5	3	2	3	2	3	2	-	1	2	2	2	2	3	1	3
Average	**1.8**	**2.6**	**2**	**1.8**	**2**	**2**	**1**	**1**	**2.4**	**1.8**	**2.6**	**2.4**	**1.8**	**2.2**	**2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: Environment Studies

Course Code: A100302

Semester: 4th

L T P

Credits: 03 **3 0 0**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Acquire the basic knowledge of Environment study.
CO2	Attain the information about ecosystem and its functioning.
CO3	Understand the role of individuals in prevention of pollution.
CO4	Appreciate the ethical, cross-cultural, and historical context of the social issues of environmental, and the links between human and natural systems, environment.
CO5	Elaborate the role of information technology in the environment and the human health.

Course Contents

UNIT - I

The Multidisciplinary nature of environmental studies Definition, scope and importance (2 Lectures) Need for public awareness.

Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems. a) Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining, dams and their effects on forests and tribal people. b) Water resources: Use and over-Utilization of surface and ground water, floods, drought, conflicts and water, dams-benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies, e) Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies, f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

UNIT - II

E-Concept of an ecosystem: Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids.

Biodiversity and its conservation, Introduction – Definition: genetic, species and ecosystem diversity, Bio geographical classification of India, Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values, Biodiversity at global, National and local levels, India as a mega-diversity nation.

UNIT – III

Environmental Pollution Definition: Causes, effects and control measures of: a. Air pollution b. Water pollution c. Soil pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards ill-effects of fireworks, Solid waste Management: Causes, effects and control measures of urban and industrial wastes, Role of an individual in prevention of pollution, Disaster management: floods, earthquake, cyclone and landslides.

UNIT – IV

Social Issues and the Environment: From Unsustainable to Sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management, Resettlement and rehabilitation of people; its problems and concerns, Environmental ethics: Issues and possible solutions, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Wasteland reclamation, Consumerism and waste products, Environment Protection Act, Air (Preventation and Control of Pollution) Act, Water (Prevention and control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation.

Human Population and the Environment: Population growth, variation among nations, Population explosion– Family Welfare Programme, Environment and human health, Human Rights, Value Education, HIV / AIDS, Women and Child Welfare

Suggested Books:

1. Agarwal K.C. (2001). *Environment Biology,* Nidi Publ. Ltd. Bikaner.

2. Jadhav H & Bhosale (1995). *Environment Protection and Laws,* Himalaya Pub House, Delhi 284p.V.M.

3. Rao M.N. & Datta A.K. (1987). *Waste Water Treatmen,* Oxford & IBH Publ. Co. Pvt. Ltd. 45p.

4. Cunninghan W.P. *Principle of Environment Science*.

5. Joseph. *Essentials of Environment Science*.

6. Rao C.S. *Environment Pollution Control Engineering*.

7. Kaushik A. *Perspectives in Environmental Studies.*

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	1	3	2	1	1	3	-	2	2	3	2	3	2	2
CO2	1	2	1	3	2	3	3	-	3	2	3	3	2	3	1
CO3	3	2	2	2	2	2	3	1	2	2	2	2	2	3	2
CO4	3	1	3	3	1	2	3	-	3	2	3	3	2	3	3
CO5	2	3	2	3	3	2	3	-	2	3	2	2	3	2	1
Average	**2.2**	**1.8**	**2.2**	**2.6**	**1.8**	**2**	**3**	**1**	**2.4**	**2.2**	**2.6**	**2.4**	**2.4**	**2.6**	**1.8**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.
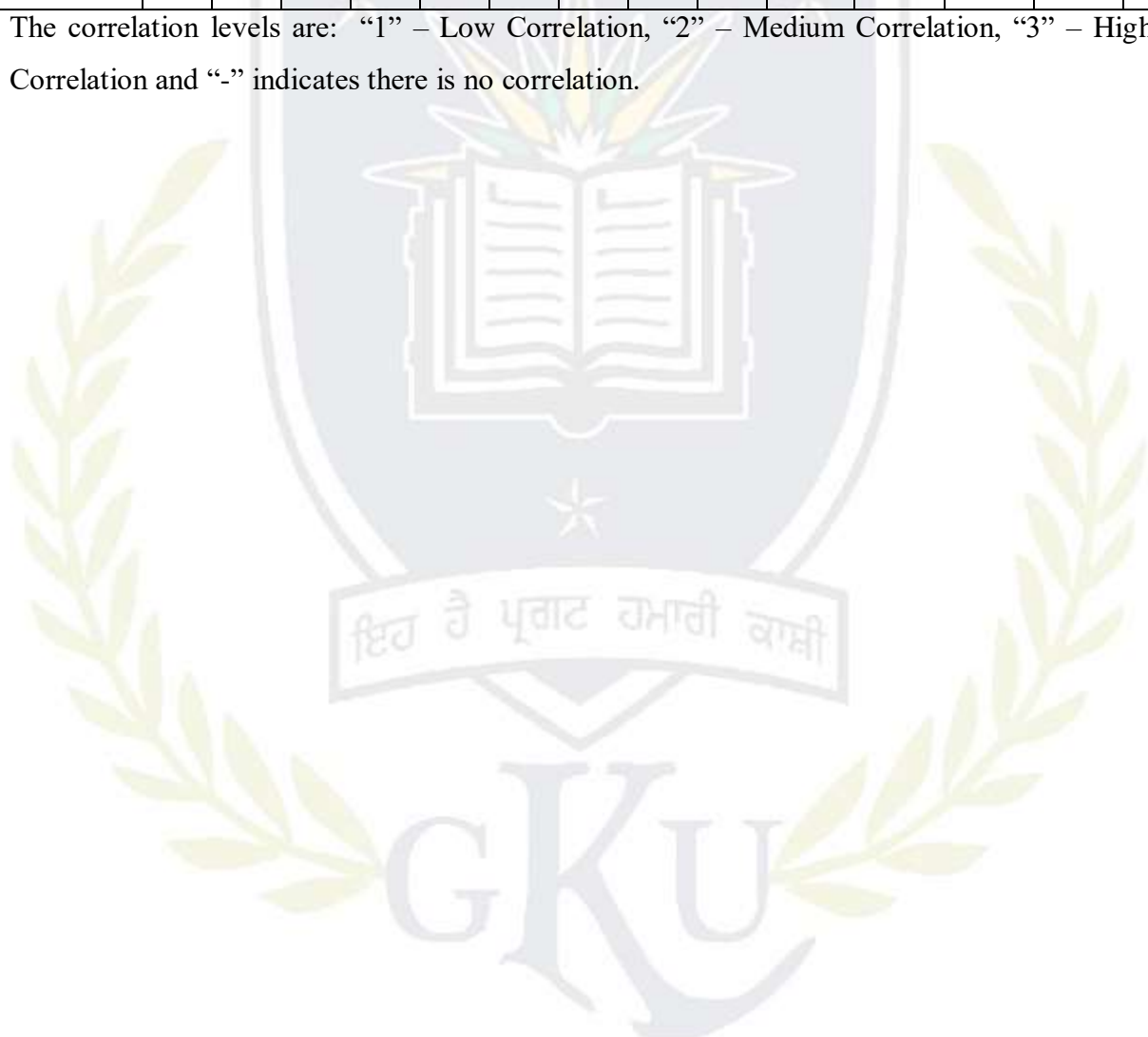
Course Name: Mathematics

Course Code: A300404

Semester: 4th

L T P

Credits: 05   **4 1 0**

Course Outcomes: On successful completion of this course, the students will be able to:

CO	Statement
CO1	Learn and Manipulate the matrix algebra.
CO2	Compute determinants and solve linear equations.
CO3	Understand the difficult equations using various methods.
CO4	Formulate the statistics and their use in field.
CO5	Solve an integral Calculus.

Course Contents

UNIT - I

Matrix Algebra: Introduction of a matrix, its different kinds, matrix addition and scalar multiplication, Multiplication of matrices, Square matrix, Transpose, Adjoint and Inverse of a matrix ,Matrix method ,Cramer rule, Rank of a matrix, Solving simultaneous equations using Gauss elimination method, Gauss Jordan Method and matrix, inversion method

UNIT - II

Differential Calculus: Introduction, Differentiation, Derivative of a Function of One Variable, Power Function, Sum and Product of Two Functions, Function of a Function, Differentiation by method of substitution, Maxima and Minima

UNIT – III

Integral Calculus: Indefinite Integral, Integration by substitution, integration by parts,, Integration by partial fractions, definite integral. Numerical integration: Trapezoidal method, simpson's 1/3 rule, simpson's 3/8 rule.

UNIT – IV

Statistics: Measures of central tendency, Preparing frequency distribution table, arithmetic mean, Geometric mean, harmonic mean, median and mode. Measures of dispersion: Range, mean deviation, standard deviation, co-efficient of variation, moments, Skewness and Kurtosis

Text Books:

1. Rajaraman. *Computer Oriented numerical methods.*

2. Grewal. *Numerical methods to Engg.*

3. Sancheti D.C. *Business Mathematics.*

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	1	2	1	1	1	2	-	-	2	2	3	2	3	2	2
CO2	2	1	2	3	1	1	-	1	3	1	3	3	2	2	1
CO3	2	3	2	2	2	2	-	-	2	2	2	2	3	3	2
CO4	2	3	3	3	2	2	-	-	3	1	3	3	3	2	3
CO5	3	1	1	1	3	2	-	-	2	2	2	2	2	3	2
Average	**2**	**2**	**1.8**	**2**	**1.8**	**1.8**	**-**	**1**	**2.4**	**1.6**	**2.6**	**2.4**	**2.6**	**2.4**	**2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.

Course Name: S/W Lab VIII (Data Base Management Systems)

Course Code: A300405

Semester: 4th

L T P

Credits: 03   **0 0 6**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Solve the query of database using SQL DML / DDL commands.
CO2	Enforce integrity constraints on a database.
CO3	Apply the basic concepts of Database Systems and Applications.
CO4	Design a commercial relational database system (Oracle, My SQL) by writing SQL using the system.
CO5	Analyze and Select storage and recovery techniques of database system.

Course Contents

1. Introduction to DBMS & SQL.
2. To implement Various DDL comment.
3. Implement the DML commands.
4. Study of Various types of data Constraints and implementation.
5. Study of all types of operators.
6. Implement the concept of Set Operators.
7. Explore select clauses -order by, having etc.
8. Implement the concept of Inbuilt Function.
9. Implement the concept of Joins,
10. Implement the concept of views.
11. Implement the concept Of Indexes

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	1	2	1	2	2	2	-	-	2	1	3	2	1	3	1
CO2	2	2	2	2	1	3	-	-	3	1	3	3	2	2	1
CO3	2	1	2	3	3	2	-	1	2	2	2	2	3	3	3
CO4	2	1	2	2	2	2	1	-	3	1	3	3	3	3	2
CO5	3	1	3	2	3	3	-	-	2	2	2	2	2	2	3
Average	2	1.4	2	2.2	2.2	2.4	1	1	2.4	1.4	2.6	2.4	2.2	2.6	2

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.

Course Code: 300408

Semester: 4th

L T P

Credits: 03 **0 0 6**

Course Outcomes: On successful completion of this course, the students will be able to:-

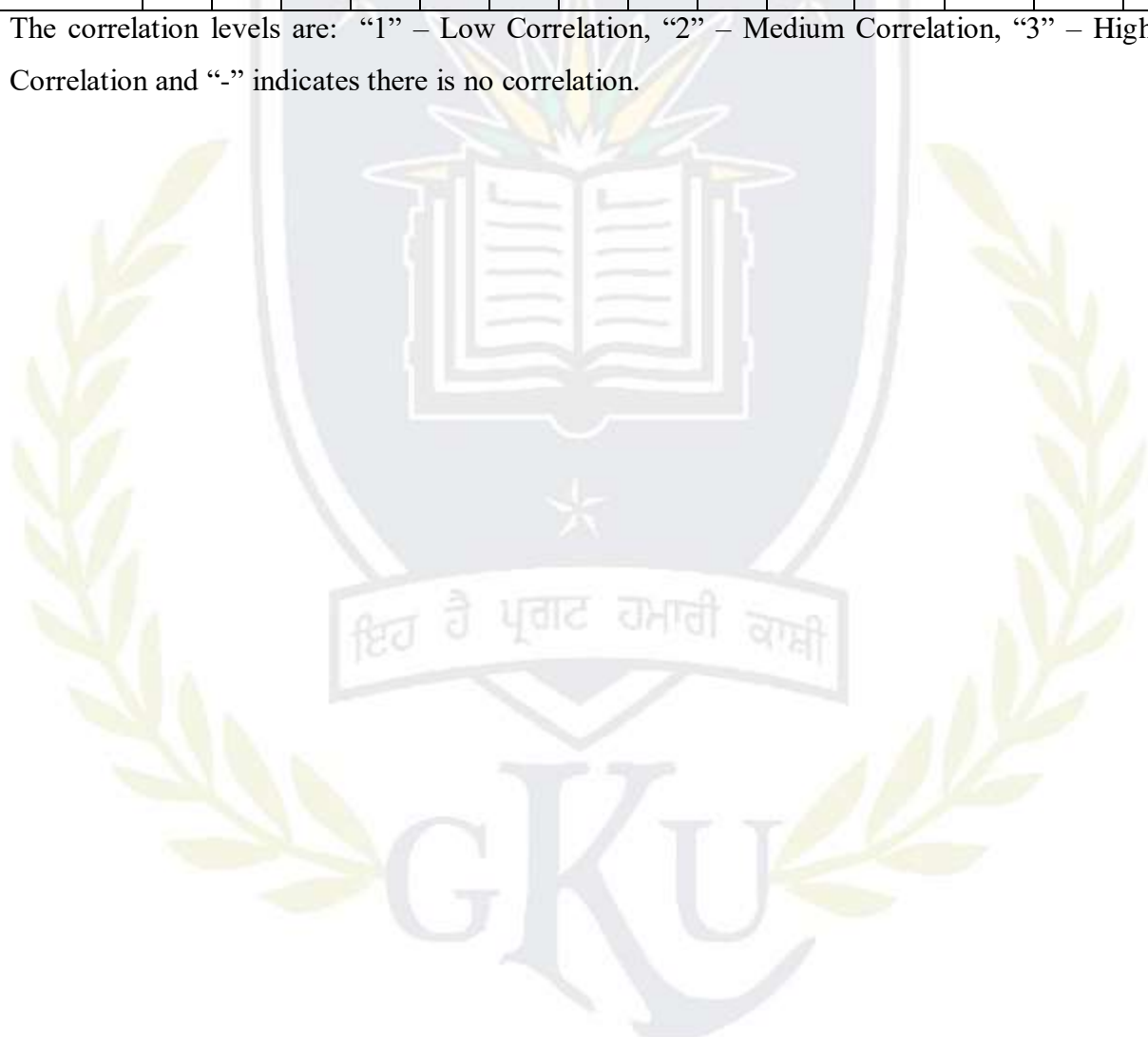| CO	Statement
CO1	Learn about the concepts of PHP scripting language for the development of Internet websites.
CO2	Imbibe the basic functions of My SQL database program.
CO3	Analyze the relationship between the client side and the server side scripts.
CO4	Develop a final project using the learned techniques.
CO5	Upload the Files on the server side using PHP.

Course Contents

1. Create a basic web page to show use of head, title, and body tag.

2. Create a web page to show use heading and text formatting tags.

3. Create a web page to show use img, ul, ol and anchors.

4. Create a web page to show use tables and div tags.

5. Create a web page using class, id and inlinestyles.

6. Create a web page to create aform.

7. Create a web page to show an alert using java script.

8. Show the use of get Element by Id in java script.

9. Create a web page using variables, loop and Conditions in java script.

10. Create a web page using Switch in java script.

11. Create a web page to show use of j query.

12. Create a web page to implement get & post in ajax.

13. Create a web page to print your name using PHP.

14. Create a web page to show use of all data types in PHP

15. Create a web page to show use loops & Conditional Statements.

16. Create a web page to show use arrays in PHP

17. Create database and tables in MySQL.

18. Fetch and display data from MySQL table in a web page using PHP.

19. File uploads to server using PHP

20. Working with cookies and sessions.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	1	1	3	3	2	-	-	2	2	3	2	2	3	3
CO2	1	2	2	2	3	2	-	-	3	1	3	3	3	2	1
CO3	2	2	3	3	2	3	-	-	2	2	2	2	2	1	3
CO4	3	1	3	1	3	2	1	-	3	1	3	3	3	3	2
CO5	1	2	1	3	1	2	-	1	2	3	2	2	3	2	1
Average	1.8	1.6	2	2.4	2.4	2.2	1	1	2.4	1.8	2.6	2.4	2.6	2.2	2

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.

Course Name: Introduction to Java

Course Code: A300501

Semester: 5th

L T P

Credits: 05   **4 1 0**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Solve the computational problems using basic statements like if-else, control structures, array, and strings.
CO2	Learn about the user requirements for software functionality in Java programming language.
CO3	Run a software applications using java programming language.
CO4	Know about basic principles of creating Java applications with Applet programming.
CO5	Develop a given program using the basic elements like Control and Conditional statements.

Course Contents

UNIT - I

Introduction to Java: Introduction to java , Java History, Java Features; How Java Differs from C and C++; Comments in java, Java Program Structure, Implementing a Java Program, Java Virtual Machine, Command Line Arguments, Programming Style, Java and Internet, Java and World Wide Web, Web Browsers, Hardware and Software Requirements; Java Support Systems, Java Environment. Java Tokens; Java Statements

UNIT - I

Constants, Variables and Data Types: Introduction; Constants, Variables, Data Types, Introduction to Operators, Expressions, Operator Precedence. Decision Making, Branching and Looping: Decision making and branching Statements, Looping Statements, Labelled loops, Jumping Statements.

UNIT – III

Classes, Objects and Methods: Introduction, Defining a Class, Data member, member function, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods. Arrays, Strings, Vectors: Arrays, Zagged Arrays, Strings, String functions: Vectors, Wrapper Classes. Inheritance: Extending a Class,

Overriding Methods, Final Variables and Methods, Final Classes, Finalizer Methods, Abstract Methods and Classes, Visibility Control.

UNIT – IV

Interfaces: Introduction, Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interface Variables, Implementing Multiple Inheritance using Interfaces. Packages: Introduction; System Packages, Using System Packages, Naming Conventions, Creating Packages, Accessing a Package, Using a Package, Adding a Class to a Package, Hiding Classes.

Managing Errors and Exceptions: Introduction; Types of Errors; Exceptions, Exception Handling using Try, Catch and Finally block: Throwing Our Own Exceptions, Using Exceptions for Debugging. Applet Programming: Introduction; How Applets Differ from Applications; Applet Life Cycle; Creating an Executable Applet

Text Books:

1. Balaguruswamy E. *Programming with JAVA*.
2. *Java Network Programming*, Publisher: Manning Publications.
3. Patrick Naughton and Michael Morrison. *The JAVA handbook*.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	3	3	1	3	2	1	-	2	2	3	2	2	3	2
CO2	2	1	2	1	3	2	-	1	3	1	3	3	1	2	1
CO3	1	2	2	3	3	3	-	-	2	2	2	2	2	3	2
CO4	2	2	2	1	2	2	-	1	3	1	3	3	2	3	1
CO5	3	1	2	1	1	1	1	-	2	2	2	2	3	1	3
Average	2	1.8	2.2	1.4	2.4	2	1	1	2.4	1.6	2.6	2.4	2	2.4	1.8

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: Computer Networks

Course Code: A300502

Semester: 5th

L T P

Credits: 05   **4 1 0**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Learn about the layers of the OSI model and TCP/IP.
CO2	Compare and Identify various network topologies.
CO3	Identify the types of application process protocols.
CO4	Understand the various data link layer and network protocols.
CO5	Classify the working of the Internet.

Course Contents

UNIT - I

Data communications concepts: Digital and analog parallel and serial synchronous and asynchronous, simplex, half duplex, full duplex, multiplexing.

Communication channels: Wired transmissions: Telephone lines, leased lines, switch line, coaxial cables, base band, and broadband, optical fibre transmission.

UNIT - II

Wireless transmission: Microwave transmission, infrared transmission, laser transmission, radio transmission, and satellite transmission, Communication switching techniques; Circuit switching, message switching, packet switching.

UNIT – III

Network reference models: Network topologies, OSI references model, TCP/IP reference model, comparison of OSI and TCI reference model. Data link layer design issue: Services provided to the network layer, framing, error control, flow control, HDLC, SDLC, data link layer in the internet (SLIP, PPP).

UNIT – IV

MAC sub layer: CSMA/CD, IEEE standards, FDM, TDM, CDMA.

The Network Layer: Design Issues,

Routing Algorithms: Optimality principled, shortest path routing, Concept of Internet Working.

Text Books:

1. Tannenbaum S. Andrew. *Computer Networks,* PHI.

2. S.K. Bansandra.*Computer Today,* Galgotia Publications.

3. Black, Ullysee. *Data Communication System*, PHI.

4. Stalling. *Data and Computer Communications,* PHI.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	2	2	1	2	-	-	2	2	3	2	1	1	3
CO2	2	1	3	2	2	1	-	-	3	2	3	3	3	2	2
CO3	1	2	2	3	2	3	1	1	2	1	2	2	2	3	1
CO4	3	2	3	1	1	2	-	-	3	2	3	3	2	2	3
CO5	1	2	2	1	3	2	-	-	2	3	2	2	2	3	2
Average	**1.6**	**1.8**	**2.4**	**1.8**	**1.8**	**2**	**1**	**1**	**2.4**	**2**	**2.4**	**2.4**	**2**	**2.2**	**2.2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.

Course Name: Software Engineering

Course Code: A300503

Semester: 5th

L T P

Credits: 05   **4 1 0**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Figure out the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction and deployment.
CO2	Review the techniques of software lifecycle.
CO3	Gain knowledge about DFDs, Entity Relationship diagrams etc.
CO4	Perform the various testing techniques.
CO5	Prepare the Documentation of Software Requirement Analysis (SRS).

Course Contents

UNIT - I

Software: Characteristics, Components, Applications

Software Process Models: Waterfall, Spiral, Prototyping, Fourth Generation Techniques, Concepts of Project Management, Role of Metrics &Measurements.

UNIT - II

S/W Project Planning: Objectives, Decomposition techniques: S/W Sizing, Problem based estimation, Process based estimation

Cost Estimation Models: COCOMO Model, the S/W Equation.

UNIT – III

System Analysis: Principles of Structured Analysis, Requirement analysis, DFD, Entity Relationship diagram, Data dictionary.

S/W Design: Objectives, Principles, Concepts, Design methodologies: Data design, Architectural design, procedural design, Object oriented concepts

UNIT – IV

Testing fundamentals: Objectives, principles, testability, Test cases: White box & Black box testing.

Testing strategies: verification & validation, unit test, integration testing, validation testing, system testing

Text Books:

1. Pressman S Roger (1992). *Software Engineering, A Practitioner's Approach*, Third Edition, Mc Graw Hill.

2. Fairley E.R. (1985). *Software Engineering Concepts,* Mc Graw Hill.

3. Jalota Pankaj (1992*). An Integrated Approach to Software Engineering,* Narosa Publishing House.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	1	1	2	2	1	2	-	-	2	2	3	2	2	2	2
CO2	2	3	2	2	2	3	1	-	2	2	3	3	2	3	3
CO3	1	2	2	3	2	2	-	1	1	1	2	2	2	3	1
CO4	3	2	3	1	2	3	-	-	2	2	3	3	3	2	2
CO5	2	2	2	2	3	2	1	-	2	1	2	2	2	3	1
Average	**1.8**	**2**	**2.2**	**2**	**2**	**2.4**	**1**	**1**	**1.8**	**1.6**	**2.6**	**2.4**	**2.2**	**2.6**	**1.8**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: Computer Graphics

Course Code: A300601

Semester: 5th

L T P

Credits: 05   **4 1 0**

Course Outcomes: On successful completion of this course, the students will be able to:

CO	Statement
CO1	Provide comprehensive introduction about computer graphics system, design algorithms and two dimensional transformations.
CO2	Know about the techniques of clipping, three dimensional graphics.
CO3	Acknowledge the relation between the images displayed on screen.
CO4	Involve in various design activities such as testing, rendering, shading and animation.
CO5	Draw different shapes with the help of algorithms.

Course Contents

UNIT - I

Input devices: Keyboard, Touch panel, light pens, Graphic tablets, Joysticks, Trackball, Data glove, Digitizers, Image scanner, Mouse, Voice & Systems. Hard copy devices: Impact and non impact printers, such as line printer, dot matrix, laser, inkjet, electrostatic, flatbed and drum plotters.

UNIT - II

Video Display Devices: Refresh cathode ray tube, raster scan displays, random scan displays, color CRT, monitors, direct view storage tube, flat, panel displays; 3,D viewing devices, raster scan systems, random scan systems, graphics monitors and workstations.

Scan conversion algorithms for line, circle and ellipse, Bresenham's algorithms, area filling techniques, character generation.

UNIT – III

2 Dimensional Graphics: Cartesian and Homogeneous coordinate system, Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing), Two-dimensional viewing transformation and clipping (line, polygon and text).

UNIT – IV

3 Dimensional Graphics: Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing), Mathematics of Projections (parallel & perspective). 3D viewing transformations and clipping

Text Books:

1. Hern and Baker. *Computer Graphics*, 2nd Edition, PHI, New Delhi.

2. Rogers. *Principles of Computer Graphics,* MGH Pub New Delhi.

3. Schaum's. *Outline Series Computer Graphics,* MGH Publications.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	3	3	3	3	2	1	-	2	2	3	2	2	3	2
CO2	2	2	1	2	3	3	-	1	3	1	3	3	2	2	3
CO3	1	2	2	1	3	2	1	-	2	2	2	2	2	3	2
CO4	2	2	2	1	2	3	-	-	3	2	3	3	3	3	2
CO5	3	2	1	3	1	1	1	1	2	3	2	2	1	1	1
Average	**2**	**2.2**	**2.2**	**2**	**2.4**	**2.2**	**1**	**1**	**2.4**	**2**	**2.6**	**2.4**	**2**	**2.`4**	**2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.

Course Name: S/W Lab –X (Java)

Course Code: A300505

Semester: 5th

L T P

Credits: 04   **0 0 8**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Learn about the concepts of object oriented programming.
CO2	Test the performance of Exception handling and Multi threading.
CO3	Apply the concepts of packages to develop efficient and error free codes.
CO4	Debug the Java programs.
CO5	Develop a Applet code using Java Programming

Course Contents

1.   Introduction to JAVA, Class, Object, Package, Applet

2.   Write a Java programs which does the creation of Class and object.

3.   Usage of import statement and package declaration in java programs.

4.   Declaring variables of various data types and their effect by changing the access modifiers like private, public, protected, default.

5.   Write a program which makes use of Comparison Operators.

6.   Write programs which make use of Arithmetic Operator.

7.   Write a program which makes use of Logical Operators.

8.   Write a program which make use of control Statement like if, while, do while.

9.   Write Java programs, which make use of Statement like Try, catch, finally.

10.   Write a Java program, which make use of control Statement like Try, catch, finally, throw, and throws.

11.   Write code snippets which make usage of Method Overloading, Using super, this, super (), this () in Java Programs.

12.   Write code snippets which make usage of method Overriding.

13.   Write code snippets which make Applet.

14.   Write code snippets which make usage of recursion.

15.   Write code snippets which make usage of Thread.

16.   Write code snippets which make usage of Thread Synchronization.

17.   Write code snippets which make usage of String Methods.

18. Write code snippets which make usage of Swing Package.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	2	2	1	3	2	1	1	2	3	3	2	1	3	3
CO2	1	2	3	2	2	3	1	-	3	3	3	3	2	2	1
CO3	2	2	2	2	1	2	1	1	2	3	2	2	3	3	3
CO4	3	2	2	2	3	3	1	-	3	3	3	3	2	2	2
CO5	2	3	3	3	2	3	1	1	2	3	2	2	1	1	1
Average	**2**	**2.2**	**2.4**	**2**	**2.2**	**2.6**	**1**	**1**	**2.4**	**3**	**2.6**	**2.4**	**1.8**	**2.2**	**2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.
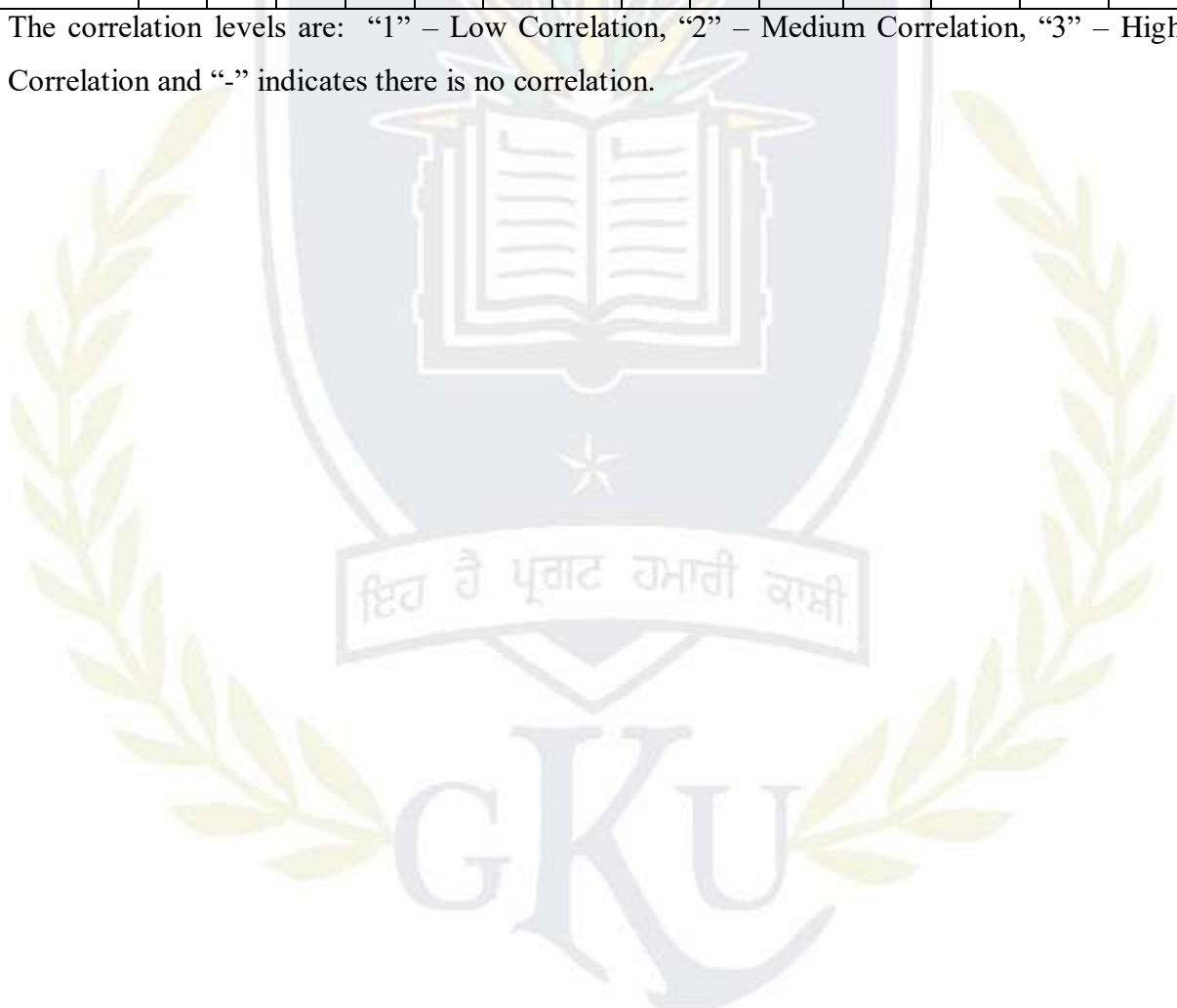
Course Name: S/W Lab –XIII (Computer Graphics)

Course Code: A300605

Semester: 5th

L T P

Credits: 04   **0 0 8**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Learn mathematical operations to develop Computer programs.
CO2	Understand scientific and strategic approach to solve complex problems in the domain of Computer Graphics.
CO3	Define the concepts related to Computer Vision and Virtual reality.
CO4	Apply the logic to develop animation and gaming programs.
CO5	Implement Flood Fill Algorithm.

Course Contents

1.   Write a Program to Draw a Line

2.   Write a Program to Draw a Circle

3.   Program to Implement DDA Line Algorithm

4.   Draw a Line Using 'Bresenham's Line Algorithm'

5.   Draw a Circle Using 'Bresenham's Circle Drawing Algorithm'

6.   Write a Program to Draw a Mid Point of Circle

7.   Write a Program for Flood Fill Algorithm

8.   To Fill a Polygon Using 'Flood-Fill' Algorithm.

9.   Write a program for 'Boundary-Fill' Algorithm.

10.   Program To Implement Line Clipping.

11.   Write a Program For Translation.

12.   Write a Program For Scaling.

13.   Use phings to show the objects in various views.

14.   Show a unit cube in perspective view.

15.   Demonstrate Beizer Curves.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	1	1	1	2	2	1	1	2	1	3	2	2	3	2
CO2	1	3	2	2	1	1	-	2	3	2	3	3	3	2	3
CO3	2	2	2	3	1	2	1	1	2	1	2	2	2	3	2
CO4	2	1	2	1	3	1	-	2	3	2	3	3	2	2	2
CO5	3	1	3	1	2	2	1	1	2	3	2	2	3	2	1
Average	**2**	**1.6**	**2**	**1.6**	**2**	**1.6**	**1**	**1.4**	**2.4**	**1.8**	**2.6**	**2.4**	**2.4**	**2.4**	**2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.

Course Name: Multimedia Systems

Course Code: A300602

Semester: 6th

L T P

Credits: 05   **4 1 0**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Learn the technical aspects of multimedia system.
CO2	Get knowledge of image animations.
CO3	Understand the various audio and video formats.
CO4	Apply different coding techniques for solving problems.
CO5	Analyze multimedia tools for WWW.

Course Contents

UNIT - I

Multimedia: Meaning and its usage, Stages of a Multimedia Project & Multimedia Skills required in a team, Text: Fonts & Faces, Using Text in Multimedia, Font Editing & Design Tools, Hypermedia & Hypertext. Sound: Multimedia System Sounds, Digital Audio, MIDI Audio, Audio File Formats, MIDI vs Digital Audio, Audio CD Playback, Audio Recording, Voice Recognition & Response.

UNIT - II

Images: Still Images – Bitmaps, Vector Drawing, 3D Drawing & rendering, Natural Light & Colors, Computerized Colors, Color Palletes, Image File Formats, Macintosh & Windows Formats, Cross Platform format. Animation: Principle of Animations. Animation Techniques, Animation File Formats. Video: How Video Works, Broadcast Video Standards: NTSC, PAL, SECAM, ATSC DTV, Analog Video, Digital Video, Digital Video Standards – ATSC, DVB, ISDB, Video recording & Shooting Videos, Video Editing, Optimizing Video files for CD-ROM, Digital display standards.

UNIT – III

Hardware: Macintosh versus Windows, Connections: IDE, SCSI, UIDE, ATA, USB, Fire wire etc. Storage devices, Input , Output devices for Multimedia Projects Multimedia Software Tools: Text Editing & Word processing tools, OCR S/W, Painting &Drawing Tools, 3D Modelling & Animation Tools, Image editing tools, Sound Editing tools,

Animation, Video & Digital movie tools, Overview of various types of Multimedia Authoring tools.

UNIT – IV

Compression: CODEC, Types of Compression & redundancies, GIF, JPEG & MPEG Standards, Overview, Fractals Multimedia tools for WWW & Designing for WWW: Plug Ins, Text, Images, Sound & Animation for the Web.

Text Books:

1. Tay Vaughan (1999). *Multimedia: Making it work,* TMH.

2. Parekh Ranjan and Gupta Vikas (2008). *Principles of Multimedia,* Tata McGraw Hill Title: Coundex DTP Course KIT, Publishers: Wiley.

3. Ralf Steinmetz and Klara Naharstedt (2001). *Multimedia: Computing, Communications Applications,* Pearson.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	1	1	1	1	2	1	-	2	3	3	2	2	3	2
CO2	2	2	2	1	2	3	1	1	3	3	3	3	3	3	1
CO3	3	2	3	2	1	1	1	-	2	3	2	2	2	3	3
CO4	2	2	3	3	2	2	1	-	3	3	3	3	3	2	2
CO5	3	3	1	2	2	2	1	1	2	3	2	2	2	3	1
Average	2.4	2	2	1.8	1.6	2	1	1	2.4	3	2.6	2.4	2.4	2.8	1.8

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: System Software

Course Code: A300603

Semester: 6th

L T P

Credits: 05   **4 1 0**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Understand the various elements of assembly language.
CO2	Compare the single pass and two pass assembler.
CO3	Design the macro processor.
CO4	Learn the basic functioning of compiler.
CO5	Classify the linker and loader.

Course Contents

UNIT - I

Introduction to software processors: elements of assembly language programming; assembly scheme, single pass and two pass assembler, general design procedure of a two pass assembler.

UNIT - II

Macros and Macro processor: macro definition, macro expansion, and features of macro facility, design of macro processor.

UNIT – III

Overview of compilers: memory allocation, lexical analysis, syntax analysis, Intermediate code generation and optimization, local and global optimization, code generation.

UNIT – IV

Loaders and linkage editors: Introduction to Loading, linking and relocation, program linking, linkage editors, dynamic linking, bootstrap loader. Other system software: Operating System, DBMS, Functions and structure of Text Editor.

Text Books:

1. Dhamdhere (1996). *Systems Programming and operating systems,* TMH.

2. Donovan (1991). *System Programming,* Mc Graw Hill.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	1	1	3	2	1	1	-	2	1	3	2	2	3	2
CO2	1	3	2	2	1	1	1	-	3	1	3	3	3	2	2
CO3	2	2	2	3	1	2	1	-	2	1	2	2	2	3	3
CO4	2	1	2	1	3	1	-	-	3	1	3	3	2	2	3
CO5	3	1	3	1	2	2	-	1	2	2	2	2	3	2	1
Average	**2.8**	**1.6**	**2**	**2**	**1.8**	**1.4**	**1**	**1**	**2.4**	**1.2**	**2.6**	**2.4**	**2.4**	**2.4**	**2.2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation

and "-" indicates there is no correlation.

Course Name: Artificial Intelligence

Course Code: 300608

Semester: 6th

L T P

Credits: 04   **4 0 0**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Solve basic AI based problems.
CO2	Learn about prepositional logic.
CO3	Analyze the MYCIN expert system.
CO4	Apply AI techniques to real-world problems to develop intelligent systems.
CO5	Understand the concept of Artificial Intelligence.

Course Contents

UNIT-I

Introduction: What are AI, Importance of AI, and Early work in AI, Applications of AI, Knowledge and its definition? Knowledge Representation: Prepositional logic, FOPL, Properties of Well formed formulas, Conversion to Clausal form, Inference rules.

UNIT-II

Structured Knowledge: Introduction, Associate frame structures, Conceptual dependencies and scripts

Knowledge Organization and Manipulation: Concepts, Uninformed or Blind search, Pattern Recognition, Recognition Classification process, Classification patterns.

UNIT-III

Expert System: Definition, Rule based architecture, Knowledge acquisition and validation, MYCIN Expert System.

UNIT-IV

Knowledge Acquisition: Types of learning, General Learning model, Performance measures.

Text Books/References:

1. Patterson Dan W. *Introduction to Artificial Intelligence and Expert Systems*, PHI Publication

2. Jackson Peterand Addison Wesley. *Introduction to Expert System*.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	3	1	3	2	1	2	2	2	3	3	2	2	3	1
CO2	2	1	2	3	3	2	1	1	3	3	3	3	2	1	2
CO3	1	2	2	3	1	2	2	1	2	3	2	2	1	2	2
CO4	1	2	3	2	2	3	1	2	3	3	3	3	1	2	3
CO5	2	1	2	3	2	2	2	2	2	3	2	2	2	1	2
Average	**1.6**	**1.8**	**2**	**2.8**	**2**	**2**	**1.6**	**1.2**	**2.4**	**3**	**2.6**	**2.4**	**1.6**	**1.8**	**2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.

Elective-I

Course Name: Soft Computing

Course Code: 300609

Semester: 6th

Credits: 4   **L T P**

                                                                                              4 0 0

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Learn about soft computing techniques and their applications.
CO2	Analyze various neural network architectures.
CO3	Understand perceptions and counter propagation networks.
CO4	Classify the fuzzy systems.
CO5	Analyze the genetic algorithms and their applications.

Course Contents

UNIT-I

Neural Networks: Introduction to neural networks, working of an artificial neuron, linear severability, perception, perception training algorithm, back propagation algorithm, Adelines and Madelines.

UNIT-II

Learning: Supervised and unsupervised learning, counter-propagation networks, adaptive resonance theory, recognition and bidirectional associative memory.

UNIT-III

Fuzzy Logic: Introduction to fuzzy logic and fuzzy sets, fuzzy relations, fuzzy graphs, fuzzy arithmetic and fuzzy if-then rules, Applications of fuzzy logic, neuro-fuzzy systems.

UNIT-IV

Probabilistic Reasoning: Introduction to probability theory, conditional probability, Baye's theorem, fuzzy logic and its relationship with probability theory.

Text Books:

1. Mehrotra Kishan, Chilkuri K. Mohan and Sanjay Ranka (2007). *Elements of artificial neural networks*.

2. H. Hassoun Mohammad (2007). *Fundamentals of artificial neural networks*, Prentice Hall of India, Edition.

3. Kosko Bart (2007). *Neural networks and fuzzy systems*, Prentice Hall of India.

4. Yen John and Langari Reza (2007). *Fuzzy logic, intelligence, control and information,* Pearson Education.

5. R. Spiegel Murray, Schiller John and Srinivasan R. Alu (2007). *Probability and statistics*, Schaum's Outlines, Tata Mc Graw Hill Publishing Company Limited.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	3	1	1	1	2	1	1	-	3	2	1	3	2	3	1
CO2	1	3	2	2	3	1	1	-	3	2	2	3	2	1	2
CO3	3	2	2	1	2	2	1	-	2	1	2	2	1	2	2
CO4	2	1	2	1	2	1	1	-	3	1	2	3	1	2	3
CO5	3	1	2	1	3	2	2	-	2	1	1	3	2	1	2
Average	2.4	1.6	1.8	1.2	2.4	1.4	1.2	-	2.6	1.4	1.6	2.8	1.6	1.8	2

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Elective-I

Course Name: Neural Networks

Course Code: 300610

Semester: 6th

Credits:- 04   **L T P**

                                                                    4 0 0

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Understand the basic concepts of Neural Networks and applications.
CO2	Learn about the feed forward networks and their training issues.
CO3	Classify different types of ANN architectures.
CO4	Analyze the deep learning concepts using Back Propagation Network.
CO5	Compare Convolution Neural Network models to Object Detection and image Retrieval.

Course Contents

UNIT-I

Neuro-computing and Neuroscience Historical notes: Human Brain, neuron Mode l, Knowledge representation, Al and NN.

Learning process: Supervised and unsupervised learning, Error correction learning, competitive learning, adaptation, statistical nature of the learning process

UNIT-II

Data processing Scaling: normalization, Transformation (FT/FFT), principal component analysis, regression, covariance matrix, Eigen values &Eigen vectors. Basic Models of Artificial neurons, activation Functions, aggregation function, single neuron computation, multilayer perception, least mean square algorithm, gradient descent rule, nonlinearly separable problems and bench mark problems in NN.

UNIT-III

Multilayered network architecture: back propagation algorithm, heuristics for making BP algorithm performs better. Accelerated learning BP (like recursive least square, quick prop, RPROP algorithm), approximation properties of RBF networks and comparison with multilayer perception.

UNIT-IV

Recurrent network and temporal feed-forward network: implementation with BP, self organizing map and SOM algorithm, properties of feature map and computer simulation.

Principal component and Independent component analysis, application to image and signal processing

Text Books:

1. Anderson J.A. *An Intoduction to Neural Networks*, MIT.

2. Hagen Demuth Beale. *Neural Network Design*, Cengage Learning.

3. Harvey R.L. *Neural Network Principles*, PHI.

4. Kosko. *Neural Network and Fuzzy Sets*, PHI.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	3	1	3	2	1	2	2	2	3	3	2	2	3	1
CO2	2	1	2	3	3	2	1	1	3	3	3	3	2	1	2
CO3	1	2	2	3	1	2	2	1	2	3	2	2	1	2	2
CO4	1	2	3	2	2	3	1	2	3	3	3	3	1	2	3
CO5	2	1	2	3	2	2	2	2	2	3	2	2	2	1	2
Average	**1.6**	**1.8**	**2**	**2.8**	**2**	**2**	**1.6**	**1.2**	**2.4**	**3**	**2.6**	**2.4**	**1.6**	**1.8**	**2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Elective-II

Course Name: Android Programming

Course Code: 300507

Semester: 6th

L T P

Credits: 05   **4 1 0**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Install Android Studio and Cross Platform Integrated Development Environment.
CO2	Learn designs of User Interface and Layouts for Android App.
CO3	Implement intents to broadcast data within and between Applications.
CO4	Use Content providers and Handle Databases using SQLite.
CO5	Introduce Android APIs for Camera and Location Based Service.

Course Contents

UNIT - I

Introduction Android: Android Versions, Features of Android, Architecture of Android Obtaining the Required Tools, Android SDK, Installing the Android SDK Tools Configuring the Android SDK Manager – Eclipse, Android Development Tools (ADT), Creating Android Virtual Devices (AVDs), Creating Your First Android Application – Types of Android Application , Anatomy of an Android Application.

UNIT - II

Activities: Fragments and Intents Understanding Activities, Creating Activities, Linking Activities Using Intents, Resolving Intent Filter Collision , Returning Results from an Intent, Passing Data Using an Intent Object, Fragments, Adding Fragments Dynamically, Life Cycle of a Fragment, Interactions between Fragments, Calling Built-In Applications Using Intents, Understanding the Intent Object, Using Intent Filters – Adding Categories, Displaying Notifications.

UNIT – III

Android User Interface: Understanding the Components of a Screen, Adapting to Display Orientation Managing Changes to Screen Orientation, Utilizing the Action Bar, Creating the User Interface Programmatically, Listening for UI Notifications, Designing Your User Interface With Views, Using Basic Views, Using Picker Views, Using List Views to Display Long Lists, Understanding Specialized Fragments – Displaying Pictures And Menus With

Views, Using Image Views to Display Pictures – Using Menus with Views, Additional Views.

UNIT – IV

Databases: Content Providers and Messaging Saving and Loading User Preferences, Persisting Data to Files, Creating and Using Databases, Content Providers, Sharing Data in Android, Using a Content Provider, Creating Your Own Content Providers, Using the Content Provider – Messaging, SMS Messaging, Sending E-mail.

Text Books:

1. Lee Wei – Meng. *Beginning Android 4 Application Development*, John Wiley & Sons, Inc.

2. Reto Meier. *Professional Android 4 Application Development,* John Wiley & Sons, Inc.

3. Zigurd Mednieks, Laird Dornin, Blake Meike G. and Masumi Nakamura. *Programming Android,* O"Reilly.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	3	3	2	2	3	2	-	-	2	1	3	2	3	2	2
CO2	1	2	2	3	2	1	1	-	2	2	3	3	3	3	3
CO3	2	3	2	2	2	3	-	1	2	2	2	2	2	1	3
CO4	2	2	3	3	3	3	1	-	2	2	3	3	3	2	2
CO5	3	3	2	3	2	2	-	1	2	1	2	2	2	3	1
Average	2.8	2.6	2.2	2.6	2.4	2.2	1	1	2	1.6	2.6	2.4	2.6	2.2	2.2

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Elective-II

Course Name : Programming Using Python

Course Code: 300611

Semester: 6th

Credits -04   **L T P**

                                                                                                        4 1 0

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Apply the basic principles of python programming
CO2	Create applications using python programming
CO3	Develop looping functions using python programming.
CO4	Understand the methods to manipulate python programs by utilizing the data structures like lists.
CO5	Develop and use Web Services using python.

Course Contents

UNIT-I

Introduction to Python Getting Started: Introduction to Python- an interpreted high level language, interactive mode and script mode

Variables, Expressions and Statements: Values, Variables and keywords; Operators and Operands in Python: (Arithmetic, relational and logical operators), operator precedence, Expressions and Statements (Assignment statement)

UNIT-II

Conditional constructs and looping: if else statement While, for (range function), break, continue, else, pass, Nested loops, use of compound expression in conditional constructs and looping

Functions: Importing Modules (entire module or selected objects), invoking built in functions, functions from math module, using random () and randint () functions of random module to generate random numbers, composition.

UNIT-III

Strings: Creating, initializing and accessing the elements; String operators: +, *, in, not in, range slice [n:m]; Comparing strings using relational operators; String functions & methods: len, capitalize, find, is alnum, isalpha, isdigit, lower, islower, isupper, upper.

Lists: Concept of mutable lists, creating, initializing and accessing the elements, traversing, appending, updating and deleting elements; List operations (joining, list slices); List functions & methods: len, insert, append, extend, sort, remove, reverse, pop

UNIT-IV

Dictionaries: Concept of key-value pair, creating, initializing and accessing the elements in a dictionary, traversing, appending, updating and deleting elements. Dictionary functions & Methods: cmp, len, clear (), get(), has_key(), items(), keys(), update(), values()

Input and Output: Output Formatting, Reading and Writing Files

Errors and Exceptions: Syntax Errors, Exceptions, Handling Exceptions, Raising Exceptions, User-defined Exceptions, Defining Clean-up Actions, Predefined Clean-up Actions

Recommended Books:

1. Dawson Michael. *Programming with python A user's Book, Cengage Learning*.
2. Beazley David. *Python Essential Reference*, Third Edition.

Reference Books:

1. J Chun Wesley (2015). *Core Python Applications Programming*, 3rdEdition, Pearson Education India.

Website/Links/Online Portal/ICT

1. https://www.davekuhlman.org/python_book_01.pdf
2. https://static.realpython.com/python-basics-sample-chapters.pdf
3. https://www.slideshare.net/yayavaram/python-programming-language-54442660

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	3	1	2	3	2	-	-	2	2	3	2	3	2	2
CO2	3	2	3	2	2	3	-	-	3	2	3	3	1	3	2
CO3	1	3	1	2	3	1	-	1	2	2	2	2	2	1	3
CO4	2	1	3	2	1	2	1	-	3	2	3	3	3	2	2
CO5	1	3	1	2	2	3	-	-	2	2	2	2	3	3	2
Average	1.8	2.4	1.8	2.0	2.2	2.2	1	1	2.4	2.0	2.6	2.4	2.4	2.2	2.2

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Course Name: S/W Lab –XII (Major Project)

Course Code: A300604

Semester: 6th

L T P

Credits: 02   **0 0 4**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Classify the programming language concepts and basics of Software Development Life Cycle model for the implementation of the project.
CO2	Plan, analyze, design and implement a software project using SDLC model.
CO3	Learn to work as a team and to focus on getting working project done within a stipulated period of time.
CO4	Undertake problem identification, formulation and solution.
CO5	Demonstrate a sound technical knowledge of their selected project topic.

Course Contents

Starting of Major Project (Feasibility Study, Requirement Analysis, Design)

Note: The marks distribution for the practical will be as under

•   Viva Voce 10marks

•   System development 30

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	1	3	2	2	3	1	1	2	2	3	2	3	2	2
CO2	2	2	3	2	3	3	-	2	3	1	3	3	1	3	1
CO3	3	2	2	2	3	2	-	1	2	2	2	2	2	3	3
CO4	2	1	2	1	3	2	1	1	3	1	3	3	3	2	2
CO5	3	2	1	2	3	3	-	1	2	2	2	3	3	1	2
Average	**2.4**	**1.6**	**2.2**	**1.8**	**2.8**	**2.6**	**1**	**1.2**	**2.4**	**1.6**	**2.6**	**2.6**	**2.4**	**2.2**	**2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High

Correlation and "-" indicates there is no correlation.

Name: S/W Lab –XIV (Multimedia Systems)

Course Code: A300606

Semester: 6th

L T P

Credits: 02   **0 0 4**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Learn about the different tools for multimedia processing.
CO2	Draw the image with proper animation.
CO3	Design the images with appropriate tools from the toolbox.
CO4	Gain the practical knowledge of image animations.
CO5	Implement the experiments with graphics and text information.

Course Contents

1. Procedure to create an animation to represent the growing moon.

2. Procedure to create an animation to indicate a wall bouncing on steps.

3. Procedure to simulate movement of a cloud.

4. Procedure to draw the fan blades and to give proper animation.

5. Procedure to display the background given through your name.

6. Procedure to create an animation with the following features:

   WEL COME

•   Letter should appear one by one.

•   The fill Color of the text should change to a different Color after the display of full word.

7. Procedure to simulate a ball hitting another ball.

8. Procedure to create an animated cursor using STARTDRAG ("SS",TRUE); MOUSE. HIDE ();

9. Procedure to design a visiting card containing at least one graphic and text information.

10. Procedure to take a photographic image. Give title for the image and put the border. Write Your names.Write the institution and place.

11. Procedure to prepare a cover page for the book in your subject area. Plan your own design.

12. Selecting your own background for organization.

13. Picture so that it given an elegant look.

14. Procedure to picture preferably on a plain background of a color of your choice-
    Positioning Includes rotation and scaling.

15. Procedure to remove the arrows and text from the given photographic image.

16. Procedure to type a word and apply the effects shadow embosses.

17. Procedure to use appropriate tools(s) from the toolbox cut the object from three files,
organizes them in a single file and applies feather effects.

18. Procedure to display the background given through your name using mask.

19. Procedure to make anyone of one of the parrots black and white in a given picture.

20. Procedure to change a circle into a square using flash.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	2	1	1	2	2	2	-	2	2	3	3	2	2	3	2
CO2	2	2	2	2	2	3	1	2	3	3	3	3	1	3	1
CO3	3	2	3	2	3	1	-	1	2	3	2	2	2	3	3
CO4	2	2	3	3	2	2	1	1	3	3	3	3	3	2	2
CO5	3	3	1	2	3	2	-	2	2	3	2	2	2	3	3
Average	**2.4**	**2**	**2**	**2.2**	**2.4**	**2**	**1**	**1.6**	**2.4**	**3**	**2.6**	**2.4**	**2**	**2.8**	**2.2**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3"

– High Correlation and "-" indicates there is no correlation.

Elective-II Lab

Course Name: S/W Lab –XI (Android programming)

Course Code: 300508

Semester: 6th

L T P

Credits: 04   **0 0 8**

Course Outcomes: On successful completion of this course, the students will be able to:-

CO	Statement
CO1	Create an application with multiple activates.
CO2	Develop menu using List view.
CO3	Classify various activities for menu items and Parsing XML files.
CO4	Write multi-Threading application.
CO5	Understand user data and multimedia on a mobile device via the Android framework libraries (Graphics, Performing with Provides).

Course Contents

1.   Creating Applications with Multiple Activities and a Simple Menu using List View

2.   Creating Activities for Menu Items and Parsing XML Files

3.   Writing Multi-Threaded Applications

4.   Using Web View and Using the Network

5.   Graphics Support in Android

6.   Preferences and Content Providers

7.   Location Services and Google Maps in Android.

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	3	2	2	2	3	2	1	2	2	3	3	2	2	1	3
CO2	3	2	2	3	2	1	-	2	3	3	3	3	3	2	2
CO3	2	3	2	2	2	3	1	2	2	3	2	2	1	3	2
CO4	2	2	3	3	3	2	1	1	3	3	3	3	3	2	1
CO5	3	3	2	3	2	3	-	2	2	3	2	2	2	2	1
Average	**2.6**	**2.4**	**2.2**	**2.6**	**2.4**	**2.2**	**1**	**2**	**2.4**	**2**	**2.6**	**2.4**	**2.2**	**2**	**1.8**

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3"

– High Correlation and "-" indicates there is no correlation.

Elective-II Lab

Course Name: Programming Using Python

Course Code: 300612

Semester: 6th

Credits -04   **L T P**

0 0 8

Course Outcomes: On successful completion of this course, the student will be able to:-

CO	Statement
CO1	Write, Test and Debug Python Programs
CO2	Implement Conditionals and Loops for Python Programs
CO3	Use functions and represent Compound data using Lists
CO4	Implement the basic conditional and looping constructs
CO5	Write the code to implement Lists Data Structure

Course Contents

PROGRAM 1: Hello World

PROGRAM 2: Add numbers and Concatenate strings

PROGRAM 3: Input from user

PROGRAM 4: Loops

PROGRAM 5: If-Else - Conditional Checking

PROGRAM 6: Functions

PROGRAM 7: Math library

PROGRAM 8: Strings

PROGRAM 9: Exceptional Handling

PROGRAM 10: Random Numbers/String

PROGRAM 11: Demo of Data Structure - List

PROGRAM 12: Demo of Data Structure - Dictionary

PROGRAM 13: Demo of Data Structure - Tuple

PROGRAM 14: Command Line Argument

Recommended Books:

1. Paul Gries, Jennifer Campbell and Jason Montojo. *Practical Programming: An introduction to Computer Science Using Python The Pragmatic Bookshelf*, second edition.

2. Allen Downey, Jeffrey Elkner (2015). *Learning with Python: How to Think Like a Computer Scientist,* Paperback.

Reference Books:

1. Hans Fangohr. *Introduction to Python for Computational Science and Engineering (A beginner's guide).*

2. Timothy A. Budd. *Exploring Python*, Mc Graw Hill Education.

Website/Links/Online Portal/ICT

1. http://www.dissidents.com/resources/LaboratoryManualForComputerProgramming.pdf

2. http://genetics.wustl.edu/bio5488/files/2017/01/SP2017_012017_Assignment1_Intros.pdf

The mapping of PO/PSO/CO attainment is as follows:

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
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CO2	3	2	3	2	3	2	-	-	3	2	3	3	2	2	2
CO3	2	3	2	3	1	3	1	-	2	2	2	2	2	3	3
CO4	2	2	3	1	2	1	-	1	3	2	3	2	2	2	1
CO5	2	3	1	2	3	3	-	-	2	2	2	2	3	3	2
Average	2.2	2.6	2.2	1.8	2.2	2.4	1	1	2.4	2	2.6	2.2	2.4	2.4	2.2

The correlation levels are: "1" – Low Correlation, "2" – Medium Correlation, "3" – High Correlation and "-" indicates there is no correlation.

Total Number of Course	43
Number of Theory Course	26
Number of Practical Course	17
Total Number of Credits	160

Academic Instructions

Attendance Requirements

A student shall have to attend 75% of the scheduled periods in each course in a semester; otherwise he / she shall not be allowed to appear in that course in the University examination and shall be detained in the course(s). The University may condone attendance shortage in special circumstances (as specified by the Guru Kashi University authorities). A student detained in the course(s) would be allowed to appear in the subsequent university examination(s) only on having completed the attendance in the program, when the program is offered in a regular semester(s) or otherwise as per the rules.

Assessment of a course

Each course shall be assessed out of 100 marks. The distribution of these 100 marks is given in subsequent sub sections (as applicable).

	Internal (50)					External (50)	Total
Components	Attendance	A1	A2	A3	MST1	MST2	ETE	
Weightage	10	10	10	10	30	30	50	
Average Weightage	10	10			30		50	100

Passing Criteria

The students have to pass both in internal and external examinations. The minimum passing marks to clear in examination is 40% of the total marks.